



# THE MONIST

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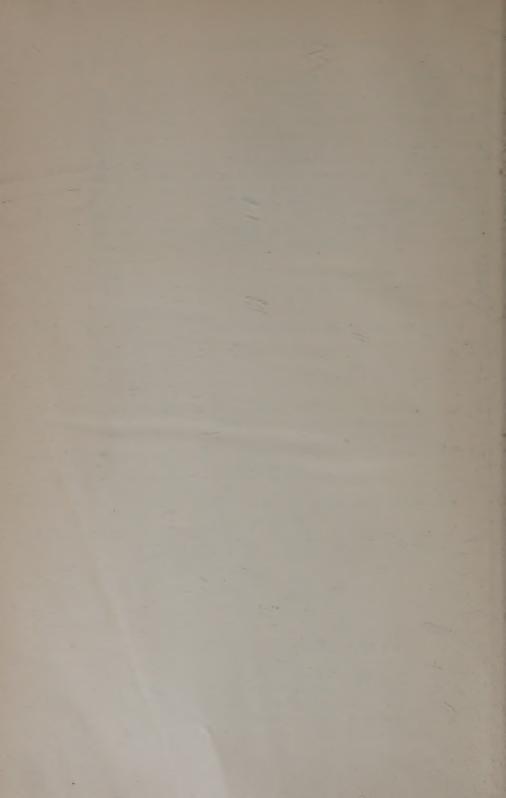
### CONTENTS OF VOLUME XXXVII

#### ARTICLES AND AUTHORS

Aesthetics, the Nature of Coherence in. By A. E. Freeman256
Alberino, Coriolano. Contemporary Philosophic Tendencies in South
America, With Special Reference to Argentina328
Alexander's Metaphysic of Space-Time. By Arthur E. Murphy357, 624
Appearance of Values, The. By Louis Arnaud Reid
Autosuggestion, The Psychological Basis of. By A. K. Sharma404
Beauty, Plato's Theory of. By G. M. A. Grube
Bernard, L. L. Hereditary and Environmental Factors in Human
Behavior
Blevin, W. P. The Theory of Sensa. An Aspect of Current Realism 50
Bodkin, Maude. Literary Criticism and the Study of the Unconscious445
Bradley, The System of. By William Curtis Swabey
Carr, H. Wildon. Science and Subjectivity
Catlin, G. E. G. Is Politics a Branch of Ethics?384
Contemporary and Philosophical Tendencies in South America, With
Special Reference to Argentina. By Alberina Coriolano328
Contemporary Russian Philosophy. By S. Frank
Coopland, G. W. Nicolas Oresme's Livre Contre Divinacion578
Current Realism in Great Britain and the United States. By R. W. Sellars. 503
Dresden, Arnold. Mathematics and Natural Science
Esthetics, The Autonomy of. By Charles E. Whitmore238
Eyans, D. Luther. The Religious Relevancy of Recent Realism 98
Evolution of Relativity. By W. A. Shimer541
Frank, S. Contemporary Russian Philosophy
Freeman, A. E. The Nature of Coherence in Aesthetics
Freud, Hegel and. By W. H. Johnston553
Grube, G. M. A. Plato's Theory of Beauty
Heath, A. E. The Notion of Intelligibility in Scientific Thought199
Hegel and Freud. By W. H. Johnston553
Hereditary and Environmental Factors in Human Behavior. By
L. L. Bernard
History, The Reality of Time and the Autonomy of. By C. O. Weber521
Hoernle, R. F. Alfred. Realism and Evolutionary Naturalism156
Hook, Sidney. Metaphysics of the Instrument335, 601
Howerth, I. W. The First Principle of Social Evolution183

Human Behavior, Hereditary and Environmental Factors in. By
I I Bernard
Infinity and the Infinitesimal. By William Parkhurst and W. J.
Kingeland Ir
Intelligibility in Scientific Thought, The Notion of. By A. E. Heath199
International Congress of Psychologists at Groningen, Report of the.
By E. Rignano
Johnston, W. H. Hegel and Freud
Kantian Relativity. By E. T. Mitchell
Kingsland, W. J., Jr. Infinity and the Infinitesimal
Literary Criticism and the Study of the Unconscious. By Maude Bodkin445
Mathematical Reality. By James Byrnie Shaw
Mathematics and Natural Science. By Arnold Dresden
Metaphysics of the Instrument. By Sidney Hook
Mitchell, E. T. Kantian Relativity
Murphy, Arthur E. Alexander's Metaphysic of Space-Time
Nicolas Oresme's Livre Contre Divinacion. By G. W. Coopland578 Parkhurst, William. Infinity and the Infinitesimal
Philosophy and Religion. By A. K. Wadia
Philosophy of Religion in French-Speaking Countries from 1914-1925.
By Emmanuel Leroux
Plato's Theory of Beauty. By G. M. A. Grube
Politics a Branch of Ethics, Is? By G. E. G. Catlin384
Psychical Processes, The Finalism of: Its Nature and its Origin.
By Eugenio Rignano
Psychological Basis of Autosuggestion, The. By A. K. Sharma404
Realism and Evolutionary Naturalism. By Roy Wood Sellars
Realism and Evolutionary Naturalism. By R. F. Alfred Hoernle156
Reality of Time and the Autonomy of History, The. By C. O. Weber521
Reid, Louis Arnaud. The Appearance of Values
Reiser, Oliver L. A Spiritual Behaviorism
Relativity, Evolution of. By W. A. Shimer541
Religion in French-Speaking Countries from 1914-1925, The Philos-
ophy of. By Emmanuel Leroux
Religious Relevancy of Recent Realism, The. By D. Luther Evans 98
Rignano, Eugenio. The Finalism of Psychical Processes: Its Nature
and Its Origin, 321; Report of the International Congress of
Psychologists at Groningen469
Russian Philosophy, Contemporary. By S. Frank
Science and Subjectivity. By H. Wildon Carr
Science and Subjectivity. Marie Collins Swabey
Sellars, Roy Wood. Current Realism in Great Britain and the United
States, 503; Realism and Evolutionary Naturalism
Sensa, The Theory of. By W. P. Blevin
Sharma, A. K. The Psychological Basis of Autosuggestion
Shaw, James Byrnie. Mathematical Reality 113
Shimer, W. A. Evolution of Relativity
Social Evolution, The First Principle of. By I. W. Howerth. 183

South America, Contemporary Philosophical Tendencies in, With
Special Reference to Argentina. By Alberino Coriolano328
Spiritual Behaviorism, A. By Oliver L. Reiser
Stapledon, Olaf. A Theory of the Unconscious
Swabey, Marie Collins. Science and Subjectivity309
Swabey, William Curtis. The System of Bradley226
Time, The Reality of, and the Autonomy of History. By C. O. Weber521
Unconscious, Literary Criticism and the Study of the. By Maude Bodkin445
Unconscious, A Theory of the. By Olaf Stapledon422
Values, The Appearance of. By Louis Arnaud Reid
Wadia A. K. Philosophy and Religion487
Weber, C. O. The Reality of Time and the Autonomy of History521
Whitmore, Charles E. The Autonomy of Esthetics238



## THE MONIST

#### CONTEMPORARY RUSSIAN PHILOSOPHY<sup>1</sup>

To give to a non-Russian reader an approximate idea of the meaning and content of recent Russian philosophy it is necessary to characterize the position of Russian philosophy in the nineteenth century. This position is determined by two historical conditions of a general nature: on the one hand, by the originality and the creative individuality of the Russian mental disposition, of the general tendencies and motives of the Russian mind; and, on the other hand, by the weakness of Russian science, its late development, and its dependence on the research of Western Europe.

Consider the large number of original and, in part at least, indisputably eminent thinkers which the Russian literature of the nineteenth century discloses—for instance, the leading spirits of the so-called "Slavophil" movement, Ivan Kireyevski and Alexi Chomyakov, or the most important representatives of the opposing "Western" direction, Chaadayev, Alexander Herze and Byelinski (in the 40's of the nineteenth century; the original and gifted philosopher of history and religious thinker, Konstantin Liontyev (in the 70's and 80's of the nineteenth century); his contemporary, Pirogov, student of philosophical pedagogy; the Russian geniuses, thinkers and poets, Tyuchev,

<sup>&</sup>lt;sup>1</sup> Translated by Karl Schmidt and Edward L. Schaub.

Dostoievski and Leo Tolstoi; the religious writer Rosanov (in the 80's and 90's), and the founder of the distinctive Russian school of religious philosophy, VI. Solovyev. While each one of these thinkers is a pronounced individuality, they nevertheless together present a general picture setting forth an absolutely original and unified national type of thought and philosophy which we venture to call "the Russian world-view" and which is sharply distinguished from the traditional thought of Western Europe.2 None of the thinkers whom we have mentioned is a philosophical investigator in the strictly scientific meaning of the word; at least, strictly scientific work with them plays but a subordinate part. As for the great artists, this is self-evident. But the others also were not scientific investigators; they were freely creating writers and intuitive thinkers, comparable, perhaps, to Nietzsche in Germany or Emerson in America.

There has, of course, also been another movement in Russia. After the founding of the universities (the first, Moscow University, was founded in 1755; the second, St. Petersburg, and the third, Charkov, in the beginning of the nineteenth century), there arose an academic systematic philosophy in the West-European form. Active in it were a number of rather able investigators. In general, however, its representatives remained considerably below the niveau of European philosophic investigation and were in their main ideas wholly dependent on it. Beginning with the 20's and 30's of the nineteenth century, there was a succession of Russian Hegelians and Schellingians who, in parallel with the development of European, and especially of German, philosophy, were succeeded by positivists, mate-

<sup>&</sup>lt;sup>2</sup> An attempt to give a presentation of this "Russian world view" in its typical outlines I have made in my lecture, *Die russische Weltanschauung*, which will appear soon in the series of lectures brought out by the Kant-Studien in Germany. Cf. also S. Frank, Wesen und Richtlinien der russischen Philosophie, in the German journal, Der Gral, 1925, No. 8.

rialists, and later still even by neo-Kantians. But from the point of view of systematic philosophy there is scarcely any value in studying this whole body of literature. With a very few exceptions, it contains nothing of real importance or originality as compared with West-European philosophy. If one looks back upon this condition of Russian scientific philosophy in the nineteenth century, one is struck by the glaring contrast between the products of the original, intuitive thinking of Russian writers and the weakness of Russian scientific philosophy.

This condition underwent an essential change toward the end of the nineteenth century, in the 80's and 90's, primarily under the powerful influence of the philosophical activity of Vladimir Solovyev. During these decades—at a time of relative decline or stagnation in West-European philosophy —there began a powerful development of Russian philosophy, which from then on rested upon a union between science and intuitive national tendencies. The center of this movement was Moscow University, where, toward the end of the 80's, there was founded the first philosophical association (under the pressure of the censor, who was then inimical to philosophy, it had to be named "Psychological Association"); also the first purely philosophical journal (Wobrosy filosofii i psichologii-Problems of Philosophy and Psychology). At about the same time there appeared the original and profoundly important scientific work of Leo Lopatin, The Positive Tasks of Philosophy (two volumes, 1884-1886) which, with fine dialectics and great thoroughness, demonstrate the untenability of the positivistic and criticistic points of view and finds the main task of philosophy to be a positive metaphysical ontology. Lopatin's analyses of the main problems of epistemology and causality, and of the concepts of time and of the soul, belong without doubt to the most important results of modern philosophical research. A decade afterwards, a highly gifted investigator in the history of philosophy, Prince Sergius Trubetzkoi (who, like Lopatin, was professor at the University of Moscow) published two important books: Metaphysics in Ancient Greece and History of the Logos-Doctrine, in which new light was thrown on the mystical and metaphysical meaning of ancient philosophy. Therewith was founded the Moscow school of metaphysical idealism. At the same time, in the 80's and 90's, we find at Kiev an original philosophical thinker, Koslov, who, in a journal written by him alone (Swoje Slowo—My Own Word), unmasks with biting irony the thoughtlessness of the ruling positivism and develops in a series of papers a metaphysics somewhat akin to that of Leibniz.

The movement just mentioned extended over into the twentieth century and gave rise to a powerful development in all fields of scientific philosophy in Russia. This philosophy on the one hand depended upon the contemporaneous development of systematic philosophy in western Europe. with the results of whose conceptual analysis it endeavored to equip itself. On the other hand, it attempted to absorb and scientifically to digest the original motifs of the Russian national mentality. Thenceforth Russian scientific philosophy was no longer the pupil of West-European philosophy, but felt itself—and we think rightly—its peer, and at the same time the guardian of a national Russian philosophical tradition. Unfortunately this promising development has during late years been strongly interfered with by the communistic revolution and the policy inaugurated therewith in higher education. During the terrible years of civil war and hunger, 1918 to 1921, there was scarcely any possibility of scientific work, and then, beginning with 1922, there started a systematic persecution (reminiscent

of the Middle Ages and of the Inquisition) of all non-materialistic philosophy, and an expulsion or a banishment from Russia of all philosophers not in accord with materialistic thought. In consequence, the greater number and the most influential of the Russian philosophers, who were at all able to save their lives, now live abroad; in Russia itself, pedagogical and literary activities in philosophy have, since 1922, become wholly impossible. We may only hope that this sad condition will not continue long enough to sever completely the thread of philosophical tradition.

We will now attempt to give a brief synoptic view of the principal results in the main fields of Russian philosophy during the last fifteen or twenty years.

#### I. Theory of Knowledge.

The theory of knowledge in its German form, as determined by Kantianism, has never had a lasting or deep influence on Russian philosophy because it runs counter to the peculiar motives of Russian thought. The Russian Kantians were as individuals either wholly unoriginal or they appropriated Criticism in a form that completely falsi-To this latter category belongs Alexander Vwedenski, recently professor at the St. Petersburg University. In his work, Logic as Part of Theory of Knowledge (1913), he develops Criticism into a sort of universal skepticism. He maintains that not only the forms of intuition and of judgment (categories), and the synthetic judgments a priori determined by them, but also the logical laws are nothing but subjective forms of human consciousness, so that all human knowledge rests on blind, unprovable belief. Therewith the logical law of contradiction becomes dubious in its ontological status. Every human judgment is thus put in doubt. Nay, even the difference between subjective and objective, between phenomena and things in themselves, is designated as purely subjective.

This theory of knowledge, therefore, cannot escape the inevitable defect of skepticism that it must appear dubious to itself. The deeper interpretations of Criticism, represented in classical German idealism as well as in the modern neo-Kantian schools, remained closed to Vwedenski. In all of them he suspected a dogmatic metaphysics condemned by Criticism.

Vwedenski's philosophical world-view remained isolated in modern Russian epistemology. The main current of the latter has run in a different, a primarily ontological, direction. To the typical Russian philosopher the theory of knowledge does not appear, after the manner of Kant, as a science which precedes metaphysics and holds the metaphysical needs within bounds, but (somewhat as is now maintained in Germany by Nicolai Hartmann) as the science which lays the foundations for metaphysics. After the above-mentioned attempt by Leo Lopatin to give a new justification for metaphysics, another Russian philosopher, also referred to above, Prince Sergius Trubetzkoi, pubished, in the 90's of the nineteenth century, a sketch of epistemology in which he maintains that the essence of knowledge consists in an actual transcendence of the limits of the knowing subject.

But the really fundamental work of the Russian theory of knowledge is Nicolai Losski's Fundamental Principles of Intuitionism (1905). Losski bases his doctrine upon a wholly original theory of consciousness, which is striking in its simplicity and which may be considered as a scientific renewal of so-called "naive realism." Consciousness is not, as is usually supposed, a closed realm—or a vessel, so to speak—which has its contents within itself. On the contrary, it is open; it is essentially a relation, a "co-ordination," between knowing subject and known object. It is therefore not necessary that consciousness should in some

way or other appropriate the objects, duplicate them within itself, or represent them. At one stroke there are thus overcome all the difficulties connected with the problem, How does consciousness attain to a knowledge of Being? or, How does Being, which lies eternally external to consciousness, enter the latter? Thus also one need not follow the path of escape adopted by the Kantian criticism. For the essential relation between the knowing subject and the object of knowledge is a primary fact concerning whose possibility no question may be raised. The principal problem of traditional epistemology, namely, how knowledge is possible, is generated simply by a false naturalistic and materialistic conception of consciousness which represents consciousness as residing somewhere in the brain, in the human head, and divorced from Being. But if we guard against confusing the ideal supra-temporal and supraspacial character of the knowing consciousness as such with the natural conditions of interaction between the external environment and the human nervous system (which should be regarded simply as the external occasion for the knowledge process), then the whole difficulty is recognized as purely imagined.

A somewhat different method of establishing an ontological theory of knowledge is adopted in my work, The Object of Knowledge: On the Foundations and Limits of Conceptual Knowledge (1915). This book is devoted to the justification, in principle, of ontologism, i. e., of the primacy of the concept of Being over that of consciousness or knowledge. It is hopeless to attempt to reach a concept of Being if we take our start from consciousness as the only primary point. If we have an idea of Being itself, in its complete transcendence—and without this idea the whole meaning of knowledge collapses—we must have it in a thoroughly primary and immediate form. And we actually

and indubitably do so have it, not only in our own Being, but also, in order that the latter itself may be possible, in Being itself; that is, in the all-embracing unity of Being to which we ourselves belong. That there is anything at all, and that therefore Being itself is, is much more evident than that "I am" or that I have consciousness. To the question of critical philosophy, Is Being external to us or only within us, in our consciousness? we must answer that both are guaranteed at one and the same time by this, that we ourselves are within Being. All knowledge, all consciousness, all conception, is really a secondary and derived mode of the appropriation of Being, transferring Being into the ideal form. What is primary, wholly self-evident, is, so to speak, Being in Being, the immediate "stepping forth" and self-revelation of Being itself as found in the ontological nature of immediate experience. If the outer world and, in general, the world of objectivity consisted of single isolated fragments, wholly foreign to us, if our own Being were a realm totally self-enclosed and divorced from all else, then we could never be sure that anything really is, and not merely appears to us in the moment of knowing. But as every individual object can be thought only within the frame and on the basis of a single allembracing Being, namely, Being itself—the same Being which also embraces and permeates ourselves—we have in this, in the becoming-aware of Being itself, which precedes every knowledge and is the basis of its meaning, the absolute guarantee for the objectivity and transcendence of our knowledge. Herewith the true meaning of the "ontological proof" (which is quite mistakenly in bad repute) becomes evident, at least in its application to the concept of Being itself. As regards any specific, temporally and spacially defined content of presentation, we may indeed properly ask whether it actually exists, or is only represented. But regarding Being itself, this question may not be put. For in this case it loses its meaning. Being itself cannot be "merely represented;" in having it we have it itself in its true reality, and not merely a representation or concept of it. For, every representation and every concept, every existential judgment, even though negative, presupposes Being itself and receives its meaning only in relation thereto.

Somewhat different attempts to overcome Criticism and to open a road to ontology are contained in works by S. Askoldom Alexeyev on *Thought and Reality* (1912) and by Prince Eugene Trubetzkoi (the brother of the previously mentioned Sergius Trubetzkoi) on *Metaphysical Presuppositions of Knowledge* (1917). For an examination of these works, however, space is here lacking.

Both Losski and myself have developed an ontological theory of knowledge, not only in its fundamental principles, but also in its application to the problems of logic (Losski in a separate work, Logic, in two volumes, 1922). I must limit myself to the general remark that both authors relate their intuitionism to the immediate intuiting of universal essences, that is, to logical realism or the Platonic doctrine of ideas. Both authors attempt to deal afresh with the principal problems of logic from the view-point of logical realism. In so doing, Losski approaches more nearly to Husserl's phenomenology, with its presupposition of an immediate intuiting of each single essence or ideal, while I, emphasizing the thorough-going unity of Being and the consequent systematic unity of concepts, reach a point of view representing a reformulation and revaluation, in the direction of ontologism, of the Hegelian philosophy and of the logical doctrines of the so-called "Marburg school." The overcoming of idealism is in my opinion equivalent to the overcoming of rationalism: by recognizing that the world of ideas, the system of logical determinations, is a

derived sphere which points beyond itself to the intuitive unity of concrete plenitude, we at once realize that our knowledge is not a self-sufficing cosmos, as idealism maintains, but that it is constituted by its relation to Being itself.

#### II. Ontology and Psychology.

For this ontologism, which is characteristic not only of the above-mentioned authors but which may be considered as a typically national trait of Russian philosophical thought, the division of philosophy into the theory of knowledge and ontology is untenable, because all philosophy, and therefore also the theory of knowledge itself, is already ontology. Only in a derived sense may the ontology of knowledge be distinguished from the other parts of ontology, somewhat as we can distinguish in Plato between the ontological theory of ideas as the basis of a theory of knowledge and the theory of ideas employed in the Timaeus as the foundation of a cosmology. If we now turn to this ontology in the narrower sense, as it is developed in modern Russian philosophy, we note, in spite of differences in individual conceptions, a general trait of decisive importance, namely, the doctrine of the organic structure of Being. This doctrine, though not yet sufficiently developed in its systematic philosophical aspect, formed the foundation of the whole conception of life even of the "Slavophil" thinkers. On it was based the profound doctrine that the church is a living spiritual organism, advanced by the great theologian Chomyakov; likewise Kireyevski's criticism of the West for its regnant tendency to disintegrate life into atoms, and his ideal of an organic totality in social life. Vladimir Solovyev's whole philosophy is centered in the doctrine of the "all-unity," i. e., of the organic structure of Being, in consequence of which every empirical manifold

depends upon the absolute divine unity which permeates it. Lopatin's metaphysics, which in general is akin to that of Leibniz, also contains a remarkable doctrine concerning the nature of causality and teleology. It explains both these categorical relations by reference to the supra-temporal unity of Being. In modern Russian philosophy this same general view has been developed in a strict systematic form in Losski's book, The World as an Organic Whole (1916). Losski takes as his basis the Platonic doctrine of ideas: the world is dominated by supra-temporal and supraspacial potencies. Every single being and every substance is penetrated and determined by these general potencies. Losski designates his view "concrete ideal-realism," and he opposes it alike to "abstract idealism" and to "inorganic naturalism" and "substantialism." To the problem of matter, Losski has devoted a special investigation, Matter in the System of the Organic World-View. From a different angle I myself have defended almost the same position in the last two parts of my above-mentioned book, The Object of Knowledge, as well as in my Introduction to Philosophy (1922). I attempt to show by a logical analysis of the concepts of number, time, law and causality, that timelessideal and temporal-real being are thinkable only in mutual relation to each other, and therefore in their dependency on the concrete and supra-temporal unity of being which combines timeless rest with living movement. But considerations of space here also compel me to pass over the very important details of the different systematic formulations.

The typically Russian philosophical ontologism has received an especially characteristic expression in Russian psychology. True, we find in Russia an empirical and experimental psychology carried on in the well-known European and American manner. And this psychology has developed rapidly during the past decades. I here pass it

by, however, because it is really a special empirical discipline rather than a part of philosophy. But there is in Russia a purely philosophical psychology of a unique character. It is in evident connection with the non-scientific psychology of the great Russian thinker-poets, Tyuchev, Dostoievski and Tolstoi. I will limit myself to a brief characterization of the general idea of this field of investigation.

In contrast with the so-called empirical psychology which approaches mental phenomena from without, and describes and logically fixes them as part of the empirical objective world, this kind of psychology attempts to describe the psychic life from within, as it appears to the one who experiences it at the moment of the experience. By this the whole ontological meaning of psychic life is changed, or rather the latter only now appears in its true ontological meaning. For if we thus consider psychic life—our dreams, emotions, passions—from within, we see in it not a small and derived part of the empirical-objective reality, but, on the contrary, a universe, a cosmos in itself, which has infinite depths and lives according to laws of its own-laws impossible and meaningless in the empirical outer world, but here obviously dominant. Not only are psychic phenomena spaceless, but, considered from within, purely in themselves, they are also timeless, in the sense that measurable mathematical time, as Bergson also has shown, is not applicable to them. Indeed, with reference to them even the logical laws of identity and contradiction have no immediate application, though, to be sure, they must be heeded by the investigator when he tries to achieve a conceptual fixation of psychical reality. In brief, psychical reality presents us, so to speak, with a wholly different dimension of the universe. Man, as a being in the outer world, appears as a minute part of the universe, and from this external point of view his nature is exhausted in this appearance. In reality, however, what we call "man" is in and for himself something infinitely larger and qualitatively wholly different from a small scrap of the world. He is a secret world of enormous, nay, potentially infinite powers compressed within a small compass. And his subterranean depths are as little like his external appearance as the interior of a large, dark cavern containing immeasurable wealth as well as suffering within itself, is like the imperceptible opening which connects it with the bright and familiar world of the surface of the earth.

This general view is maintained in a series of modern works devoted to the philosophical treatment of the problem of the soul. Thus, Leo Lopatin's chief work, The Positive Tasks of Philosophy (1884-1886) develops a Leibnizian metaphysics of the soul which, through an analysis of the metaphysical meaning of memory, emphasizes principally the supra-temporal nature of consciousness. In many respects it is in accord with the now well-known doctrines of one who was then quite unknown, the French philosopher, Bergson. Koslov has likewise elaborated a monadological metaphysics of the soul. In the 90's of the nineteenth century Nesmelov developed a philosophical anthropology which, though purely theological, was nevertheless also of very great philosophical importance. In his The Science of Man, naturalism, in its common form, is refuted with trenchant arguments, and the supernatural character of the human spirit is emphasized in connection with the Christian dogma of the divine nature of man. The same direction is taken in recent literature by the work of the prominent philosopher of religion, N. Berdyayev, The Meaning of Creation: An Essay in Anthropodicy (1915). We here have an exposition of the meaning of man as a free co-operator in the divine work of creation. In my book. The Soul of Man: A Metaphysical Introduction to Psychology (1917), I have attempted a general metaphysical characterization of the concept of the soul, on the basis

of a phenomenologistic analysis of the psychic life. In sharp contrast to this tendency, however, is a book by the above-mentioned Alexander Vwedenski: *Psychology Free from All Metaphysics* (1915. This book seeks to revive the associationistic and intellectualistic psychology from the standpoint of Criticism.

#### III. History of Philosophy.

The direction taken by research in the history of philosophy is always determined by the level and the direction of the interest in systematic philosophy. In Russia, therefore, the exploration of the older philosophical systems and doctrines has been devoted primarily to the discovery of the true metaphysical meaning of these doctrines. The important investigations of Sergius Trubetzkoi, Metaphysics in Ancient Greece (1893) and History of the Doctrine of the Logos (1900) have already been mentioned. An outstanding achievement is the two-volume work of the legal philosopher Ivan Ilyin on The Philosophy of Hegel (1916). The author emphasizes the mystic-intuitive basis of the Hegelian dialectic and the concrete-metaphysical nature of the "concept" in its Hegelian formulation. Vycheslavtzev has written a book on The Ethics of Fichte (1914) which also illumines the general metaphysical importance of Fichte's philosophy and its connection with modern German idealism. Vl. Ern has given a most interesting analysis of Italian Platonism in his essays on Rosmini's Theory of Knowledge (1914) and Gioberti's Philosophy (1916). A profound and path-breaking investigation of the principal concepts of Hindu metaphysics is contained in a book by the late young Indologist, O. Rosenberg, The Problems of Buddhistic Philosophy (1918).

#### IV. The Philosophy of Religion.

Russian philosophy has essentially a religious trend and is determined by religious interests. The most influential

Russian thinker of modern times was Vladimir Solovyev (1852-1900) whose whole life-work, though of almost uncircumscribed universality, was nevertheless devoted to the philosophy of religion. Whatever he did in the fields of epistemology, ontology, ethics, aesthetics, philosophy of history and social philosophy, was determined by his fundamental views in the philosophy of religion: his organic panentheism and his doctrine of the "divine in man," of "the becoming absolute," i. e., of the evolution of human and cosmic life toward the "deification" of all that now exists as mere creature.

It is typical of the Russian philosophical mind in general that it never seeks pure theoretical knowledge alone, but that the exploration of truth is always likewise a search for religious salvation. The most recent Russian philosophy has here again followed the national tradition. From the school of Solovjev have come in recent years several important philosophers of religion. I mention first the theologian Florenski. His important work, The Pillar and Affirmation of Truth (1914), is an attempt at a philosophical justification of the Greek orthodox belief. Florenski seeks to prove that human thinking is afflicted with unsolvable antinomies, salvation from which may be found only in the voluntary affirmation of a higher, supra-rational knowledge supplied by belief. In the dogma of the Trinity, which embraces all Being, inclusive of the human mind, is to be found the only adequate representation of this higher living truth. The divine is united with the human and with the cosmic through a special divine principle, "the holy Sophia." or divine wisdom, which forms the kernel of orthodox belief in the sanctity of the church as well as in the Mother of God. Sophia is the feminine receptive element in the concept of God; corresponding to it is that which is divine in the creature, the purity and holiness of humanity and of the cosmos, in its God-receptive status of a bride.

Florenski has influenced the philosopher of religion, S. Bulgakov. In his collection of essays, The Two Kingdoms (1913), containing a series of critical studies of modern intellectual currents and of movements in religious philosophy, the latter attempts to show the inconsistency of all forms of unbelief (of socialism, of Feuerbach's deification of man, of Nietzsche's doctrine of the heroistic superman), as well as of philosophical idealism, and to present positive Christianity as the only true ethical world-view. Bulgakov's principal work Daylight (1915), written in perfect literary style, develops a universal philosophy of religion on the basis of Greek orthodox belief. It advances a justification of the ontological religious consciousness in strong, though somewhat one-sided, opposition to the immanentism of German mysticism and idealism. Central in the exposition is the problem of a "cosmodicy," the search for the religious meaning of the cosmos, of the creature. This is found, in dependence upon Solovyev and Florenski, by disclosing the divine "Sophian" nature of the creature.

To the school of Solovyev belongs also the brother of the above-mentioned Sergius Trubetzkoi, Prince Eugene Trubetzkoi, who died in 1920 during the civil war. In his two-volume work, Vl. Solovyev's Philosophy (1913), the latter organizes into a coherent system the ideas which the various works of his master present in only a rather unsystematic form; at the same time he also takes sharp issue with the latter on a number of decisive points.

Nicolai Berdyayev is a distinguished philosopher of religion. Closely attached to the Russian religious tradition, he is nevertheless thoroughly original. His religious anthropodicy was mentioned above; and his works, now translated into German, have received wide acclaim in Germany. Berdyayev has published a whole series of works relating not merely to the philosophy of religion, but also to the philosophy of history, and to social philosophy. The principal

idea which dominates all of them is a combination of positive Christian belief with a peculiar humanism, namely, a belief in the divine task of humanity. To Feuerbach's atheistic deification of man and to Nietzsche's teachings regarding the superman, he seeks to give a positive mystical-religious foundation. God is not absolute, self-sufficient rest. His life is a mysterium, a drama, in which creation and man participate. God Himself suffers from the imperfection of the creature. He loves man and invokes his loving help. Revelation is God's call to man, to which man must respond with his free creating activity, with his efforts for the transfiguration and deification of the creature. The history of the world, the creative cultural development of humanity, is this responsive attempt of man to help God, which is of course accompanied by constant mistakes and failures. Of his works I mention only, in addition to the above, Dostoievski's World-View, The Meaning of History, and The New Middle Ages (all three of which have been translated into German). At the present time Berdyayev, in connection with the most important Russian philosophers of religion, is editing in Paris a Russian journal of the philosophy of religion, The Way.

The philosopher of religion Leo Karsavin is a purely systematic thinker. In his main work, On Principles (1925) (the title was selected in definite reminiscence of Origen), he constructs a religious philosophical system on a mystical foundation. The principal thought of this system is the concept of the all-unity. It combines within itself and overcomes theism and pantheism, the transcendence and the immanence of God, and establishes the divinity of man as the integral unity of the thinking human spirit and the divine reality. It is a daring attempt, undertaken with great learning and philosophical profundity, to represent the Greek orthodox belief as a logically coherent and strictly demonstrable philosophical system. Even though it re-

mains doubtful whether such an attempt (which wavers, so to speak, between dogmatic theology and presupposition-less systematic philosophy) can possibly succeed, it is incontestable that the book contains a wealth of profound ideas on the philosophy of religion and is distinguished by an extraordinary rigor and acumen of analytical thought.

In diametrical contrast with this purely logical and systematic movement in the philosophy of religion is the work of another original Russian philosophical writer, Leo Shestov, whose volumes (Nietzsche and Dostoievski, Potestas Clavium, The Night of Gethsemane, and others) have recently also been translated into German and French and have aroused considerable attention. In all of his works. Shestov defends a single idea: the idea that the true, divine basis of life, veritably indispensable to man, is ineffable, absolutely irrational, and capable of being grasped only through a living contact with it in religious experience. He insists upon the falsity of everything that is logically determined and universally valid, in theoretical thinking as well as in ethics. The belief in universal validity-in the "true" and the "good"-which has determined human thinking in philosophy and ethics from the first Greek thinkers, from Thales and Socrates, to Spinoza and, in our day, Husserl, is nothing but the consequence of a spiritual fall, a renunciation of spiritual freedom, a shrinking from a courageous affirmation of the terrifying absolute irrationality and unrepeatable uniqueness of life.

Russian philosophy of religion in general (as well as philosophy as a whole) has never been exclusively a purely academic affair, a task of theoretical investigation; it has always likewise been a religious effort, an expression of the quest for religious salvation. Because of the national collapse caused by atheistic communism, recent years have brought an even more intense consciousness of the need to find the way to a spiritual and national regeneration

through religious reflection and a deepening of the general world-view. Since the publication of books on religion and the philosophy of religion is absolutely impossible in Soviet Russia itself, the effort to meet this need is developing very strongly abroad, where, as mentioned above, most of the Russian philosophers and religious thinkers now live. In Berlin and Paris there have been Russian academies of religious philosophy since 1922. Here lectures on the philosophy of religion are delivered to the Russian youth. The official publication of these academies is the above-mentioned journal, The Way, in Paris. Their activity is very closely connected with the Russian Christian student movement, which started in recent years and is developing very rapidly. It is most liberally supported by the American Young Men's Christian Association. To the latter it owes also a Russian press (Y. M. C. A. Press) which has brought out a series of Russian publications on religion and the philosophy of religion, some of which are very important and, though for the most part popular and designed for the general reading public, may claim a purely theoretical interest. Without further comment, I here mention a few of these publications: A collection of essays, Problems of the Russian Religious Consciousness (with contributions from Berdyayev, Bulgakov, Losski, Frank, and others): Dostoievski's World View, by N. Berdyayev; The Fall of the Idols and On the Meaning of Life, by S. Frank; John and Peter, by S. Bulgakov; The Russian Element in Dostoievski, by B. Vysheslavtzev; The Doctrines of the Church Fathers, by L. Karsavin.

### IV. Social Philosophy, Philosophy of History, and Philosophy of Law.

Because of its religious character Russian philosophy is directed toward human life. In it, therefore, "practical philosophy" or ethics (in the wider sense of the term) inevitably holds a dominating position. The most important and most original contributions made by Russian philosophy in the 19th century (apart from religious philosophy itself) belong to this field. It must be noted, however, that ethics in the narrower sense of the term, as the doctrine of individual human conduct, of values and virtues, is represented but poorly, and indeed only as an exception, in Russian philosophical literature. Hence we may here pass it by. The situation becomes explicable if we bear in mind that Russian thought is not inclined to conceive the "good" as an abstract ideal or as a norm, but, in accordance with its religious nature, always conceives it ontologically, as the divine foundation of Being, as something concrete and existing. Thus ethics is linked up with problems of religious philosophy and ontology. On the other hand, moreover, it thinks of the "good," not individualistically, but invariably as collective, as the principle of salvation of mankind as a whole. In consequence, ethics of necessity becomes social philosophy, philosophy of history, and philosophy of law.

Thus, Russian philosophy, in its most characteristic expression, is always a religiously orientated or determined philosophy of social life. The history of Russian thought in the 19th century consists almost without exception of such religious social philosophy. The great thinkers of the "Slavophil" movement, Ivan Kireyevski and Chomyekov; their opponents, Chaadayev, Herzen, and Eyelinski; the positivists of the '60s and '70s, Chernishevski, Lavzov, Michailovski; the original genius Konstantin Leontyev, who might be called the Russian Nietzsche; and finally also Vladimir Solovyev—all have devoted themselves passionately to "practical philosophy" in the sense of a social philosophy. Everything else in their works serves only as a basis for a most earnest attempt to disclose the meaning of history and of the ideal of a just

and "true" common life of humanity. Socialism, which has played so prominent a part in Russian thought from the '60s of the 19th century to our own days, is in this sense, despite its Western origin, typical of Russian national thought. In Russia, it was almost never taken simply as a political movement, whether partisan or economic in nature; on the contrary, it was always understood as essentially a distinct religious world-view, an expression of an attempt to give life its ultimate meaning. The Bolsheviks also are not so much practical social politicians as fighting atheists, "stormers of heaven," as they once called themselves, who accept as their task the destruction of belief in God and the definite establishment of paradise on earth.

We would pass beyond the limits set for this paper if we undertook a general presentation of the most significant achievements in this very interesting field of Russian thought. We restrict ourselves to a mention of the most important publications of the last fifteen to twenty years. During this period the social philosophy of Russia has been determined primarily by a spiritual crisis leading to a thorough-going philosophical critique of socialism as well as of positivistic or materialistic humanism. The turning-point was the year of the revolution of 1905. Thereafter, Russian philosophical thought in this field began a search for new paths. In 1909 there appeared a collective work under the title, Road Indicators, with contributions from Berdyayev, Bulgarov, Struve, Frank, and others. It was devoted to a fundamental critique of revolutionary socialism and of the atheistic social utopia in general. Since then, especially since 1917 to 1918, when socialistic fanaticism became dominant and led to the tragic collapse of the whole Russian national life, several important philosophical works have appeared which combine a critique of socialism with a new and more profound

philosophical foundation of the social-political conception of life. To these publications belong Berdyayev's abovementioned The Meaning of History, which gives a religious philosophy of history; and in addition thereto, especially his Philosophy of Inequality (1922), which, in sharp contrast with political views of a socialistic-democratic type, develops the conception of an hierarchical society on the basis of a religious philosophy. We would mention also the important works of the recently deceased legal philosopher, P. Novgorodzev, The Crisis of the Modern Legal Consciousness and The Social Ideal. With great learning and clear vision Novgorodzev exhibits, in the first of these works, the crisis of the liberal-democratic legal consciousness which now prevails in the European world. The other work is devoted to a critique of the social utopia. The social ideal should not be conceived as an absolutely perfect social condition capable of being realized in its perfection. It is justifiable merely as an ideal, though unattainable, guiding principle in the actual and necessarily relative work of social reform.

The social conception now dominant is criticized from a different angle by the above-mentioned philosopher of religion (who formerly was also a distinguished historian) Leo Karsavin, in his book, *Philosophy of History* (1923). His profound investigations, which are based on an analysis of the concept of the folk-soul, or the historical individuality, as the real subject of historical evolution, culminate in a sharp critique of the dominant concept of progress. History may not be considered as an evolution whose meaning and value can be determined by reference exclusively to its last and highest stage of development. On the contrary, every historical epoch has its own immanent value, as an irreplaceable historical individuality; every age participates in the supra-temporal

unity of spiritual life and from this it derives its justification.

In my book, Outlines of a Methodology of the Social Sciences: An Introduction to Social Philosophy (1922), which sets itself in opposition to every materialistic and naturalistic social philosophy, I have attempted to disclose the spiritual foundations of social life. I find the essence of social life in "subsisting" or "living" ideas, which are indeed realized by human activity but which, as regards their reality, are independent of individual human wills and must be considered as a peculiar over-individual and superhuman sphere of being.

This is not the place to discuss specialized investigations in social science, though they also represent highly important achievements in general social philosophy. I mention only briefly in this connection a work by the well-known Russian statesman and national economist, Peter Struve: Economics and Price, which presents a profound critique of socialism from the standpoint of a philosophy of economics; also B. Kistyakovski's Social Science and Law (1916), which emphasizes the reality of objective law and gives a critique of psychologism in legal science; and A. Chuproff's Outlines of a Theory of Statistics (1912), which contains discussions, of great importance also to philosophy, of the problems of the universal and the individual in social life, and of "determinism and freedom of the will."

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#### THE PHILOSOPHY OF RELIGION IN FRENCH-SPEAKING COUNTRIES FROM 1914 TO 1925<sup>1</sup>

THE title of this article must not be allowed to mislead the foreign reader. The very expression "philosophy of religion" is undoubtedly employed less in France than it is in Germany or in the English-speaking countries. In any case it does not among us designate a definite and unique discipline. In using it here we are attempting simply to envisage together the recent studies which lead either to an interpretation of religious phenomena as a whole or of one of their essential forms, or to a reasoned solution of the problem which they contain. Thus our field will include, for example, the psychology of religion as well as rational theology.

#### I.

Let us recall first of all the status of these studies in France before 1914. The dialectic method no doubt continued to have its adherents as much among the scholastic thinkers as among the idealists more or less devoted to the Hegelian tradition. For a long time, however, it had not led to any work of the first rank. The most remarkable philosophical effort aroused by the religious problem during the quarter-century preceding the war seems to be that which, in the mind of a frankly Catholic thinker, took the form of a philosophy of action. We cannot review in brief lines the profound and elaborate system which M. Maurice

<sup>&</sup>lt;sup>1</sup> Translated from the French by Edward L. Schaub. [This paper supplements the articles published in *The Monist* for July, 1926, on recent philosophical activities in French-speaking countries. The collection as a whole affords a remarkably lucid and comprehensive survey of this important sector of philosophical thought. Ed.]

Blondel has set forth under this name in his celebrated essay of 1893 and in several succeeding articles. Let us simply say that it appears to us as an original reconstruction of the thought which dominates the apologetics of Pascal. All the philosophical problems are marshalled about a central consideration: that of the essential aspirations of our will. Tracing the active manifestations of these aspirations, and pointing out how they survive inevitable disappointments, the author seeks to establish that our will transcends the phenomenal order, that it manifests the immanence in us of a transcendent deity; if, moreover, it is to remain at the crest of its original impulse, it must keep itself open to the action of this deity.

An entirely analogous conception has been presented by Father Laberthonnière in a form much less technical, very personal, and very penetrating, under the designation of moral dogmatism. Finally, in connection with one aspect of this tendency, one might cite the brilliant and courageous efforts of M. Edouard Le Roy to put into new terms the problems of dogma, of miracle, and of God. For here also it is from a deeper experience of the spiritual life, interpreted in a sense antithetical to intellectualism, that religious philosophy borrows its light, though it should be added that the thought of Bergson, whose influence is predominant in the case of M. Le Roy, perhaps presents not less of difference from than of similarity to the doctrine of Blondel.

As for the effort to treat religious phenomena in their ensemble as a strictly positive investigation, it took form in our country only within relatively recent times. It suffices to read the chapter devoted by Ribot, in his Psychologie des Sentiments (1896), to the religious sentiment, to see how little advanced the analysis of this state of consciousness was at that time. Since then the psychology of religious phenomena has made great progress. In particu-

lar, let us refer here, next to the small work by Murisier, to the works of M. Henri Delacroix. In his remarkable Etudes d'Histoire et de Psychologie du Mysticisme (1908), Delacroix, through a minute study of three great historic personalities, presented a peculiarly profound analysis of Christian mysticism, whose complex and progressive development he brought into clear relief.

Finally, sociology, in its turn, has attempted to annex to itself the study of religious facts. It will be sufficient here to call attention to the works of M. M. Hubert and Mauss, and especially to the authoritative treatise of Durkheim on Les formes élémentaires de la vie religieuse (1912). On the basis of a study of a particular set of facts, namely Australian totemism, Durkheim presents religion in its totality as a product of the collective life, as transposing into a form that is imaginative but not wholly unreal the most fundamental features of this life. If this bold thesis is far from having been demonstrated by Durkheim's work, it has at least never before been set forth in a manner at once so precise, so broad and so vigorous.

Such, in the period preceding the war, were the most notable productions of French thought in its grapple with the religious problem. What new efforts have been made subsequently to 1914 to penetrate further into this domain? It is this which we here endeavor to set forth.

#### II.

The dialectical method has not yet been abandoned by all. Under the traditional form of Thomism, it is represented by Father Jarrigou-Lagrange, though, to be sure, he has not, during the period under present consideration, given us any new philosophical works but only new editions of former publications. In the most important of these<sup>2</sup> he makes a strenuous effort to demonstrate the ex-

<sup>&</sup>lt;sup>2</sup> Dieu, son existence et sa nature. Solution thomiste des Antinomies agnostiques. Paris, Beauchesne, 3rd ed., 1920. Cf. by the same author, Le sens commun, la philosophie de l'être et les formules dogmatiques. Paris, Nouvelle Librairie Nationale, 3rd ed., 1922. (The first edition appeared in 1909.)

istence of God by the principle of causality, which of itself carries back to the principle of identity in such a way that we are compelled to choose between the affirmation of God and the acceptance of an absurdity. This type of argument appears feeble to most contemporary thinkers. Nevertheless it is necessary to point out that in certain quarters Thomism is again in vogue and that it counts enthusiastic followers, of whom the most ardent is M. Jacques Maritain.<sup>8</sup>

As concerns the dialectic of idealism, one may find a particularly significant example in the lectures by Jules Lagneau, De l'existence de Dieu,4 recently published through the devotion of one of his followers. Nowhere may we find the reflective method utilized with greater sincerity or depth. The fundamental concern of the author, strictly speaking, is not to prove the existence of God, for existence is exclusively a character of sensible things, but to penetrate to the reality of God as a principle immanent in the exercise of our own thought. Lagneau seeks to establish that the principle of all reality, transcending sense existence and even intelligible necessity, really resides in an "absolute act" of freedom, an act by which God eternally posits himself and ipso facto posits the essential identity of the ideal and the real. We need not follow the author in the windings of the ingenious dialectic by which he connects with this central principle the fundamental aspects of being. Let us simply note that according to him it is especially in the moral act that the fundamental character of reality reveals itself. For inasmuch as the thinking being in this act sacrifices the individual to the universal, he

<sup>&</sup>lt;sup>3</sup> See in particular the *Réflexions sur l'Intelligence*, Nouvelle Librairie Nationale, 1924.

<sup>&</sup>lt;sup>4</sup> Paris, Alcan, 1925. The neo-Scholastic movement has produced the book of Baron Decamps, *Le genie des Religions, les origines*, Brussels, A. Dewitt, and Paris, Alcan, 1923. But this comprehensive synthesis which takes cognizance of everything from epistemology to prehistoric facts touches everything very superficially.

attains in it the most complete certainty of the reality of God. This line of argument, which at the outset seems to carry abstraction to its culmination, itself terminates in the conclusion that the true solution of the metaphysical problem lies in action. Lagneau invokes as his masters especially Plato and Spinoza. Yet in sum, we have here a version, very pure, very personal and especially closely-knit, of that absolute idealism of an ethical cast which sprang from Kant and from Fichte, and which a Royce, for example, developed in a richer and more concrete form in America. We would not forget, moreover, that Lagneau was almost a contemporary of Royce; the book De l'Existence de Dieu reproduced lectures delivered in 1892-1893. In fact, it seems to bear the stamp of that date. For even though the taste for dialectics has of late reappeared among certain authors, it is doubtful whether this way of treating the religious problem is such as can today satisfy many minds. Yet the ideas put forth by Lagneau are far from being dead. On the one hand, his insistence on the metaphysical import of action has its equivalent in the thought of M. Blondel, though, to be sure, with very wide differences in method as well as in application. And, furthermore, the idealistic conception of a deity completely immanent in mind still seems to be more or less implicitly adopted by a number of our contemporaries. It is to be found, for example, in the thought of a Brunschvicg whose impersonal spiritualism is so resolutely hostile to all attempts at an individualization of God. Nor is the conception foreign to the mind of a former student and ardent admirer of Lagneau, divergent as are the two in style: the pithy essayist who signs himself Alain and whose name is Chartier.

The last-named writer has attempted a concrete inter<sup>5</sup> See in particular the last study contained in the small collection entitled
Nature et Liberté, Paris, E. Flammarion, 1921.

pretation of religious facts in his "pièces mal cousues," brought together under the title Propos sur le Christianisme.6 Nothing could be more impossible to summarize than this small book. Its every bit, indeed every sentence, stimulates thought with a new goad. We can only point out some of its leading tendencies. Alain places religion, and particularly Christianity, in the nexus of the history of the human spirit and he explains the latter by the continuous action of two really different factors: the play of the emotions and the effort of thought. On the one hand, he insists on the naturalistic, so to speak the corporeal, origin of religions. Seasonal festivals, dances, ceremonies, and also idols, temples, monuments—these are bodily manifestations that give rise to cult prior to legend. But to these manifestations reflection soon applies itself. Hence the pagan myths already express the idea of a universal order. In these ancient theologies, one may discern the first operation of reason. Catholicism marked a still more decisive advance in its idea of a single spiritual deity, in its teaching of human brotherhood, and in the importance which it attached to faith. Alain is concerned to show what elements of truth may be found at the basis of these dogmas, including that of the Trinity. But in so doing, he boldly transposes them. For him, as for Hegel, to comprehend a thing is already to have passed beyond it. The idea of universal spirit, advanced by the Church, now exists outside of the Church. On the one hand, it is corroborated by science, which realizes the accord of all and alone permits us to discover that which is; on the other hand, it always requires faith, but a faith freed from beliefs, reduced to its true nature, relating to "that which will come through volition"—a faith, moreover, exclusively human. Alain praises Epicurus for having denied the existence of any will hidden at the heart of the universe; and he does not sever himself

<sup>&</sup>lt;sup>6</sup> Paris, F. Rieder, 1924.

from the materialists on this point. He writes frankly: "We may adore naught but man."

In brief, the successors of Lagneau have accentuated, if not narrowed down, the somewhat vague thoughts of their master in the direction of intellectualism and of an exclusive humanism. Would we now have an example of a book comparable to that of Alain in that, though truly philosophical in thought, it is addressed to the wider public, —a book, however, that is animated by an entirely different spirit and leads to opposite conclusions? In such event, we could doubtless not do better than to select the l'Inquiétude Humaine in which Father Pierre Sanson, priest of the Oratory, has published lectures which he gave in Notre Dame in Paris before immense audiences. His theme is taken from Pascal. He treats it after the spirit of M. Blondel or, still more, of Father Laberthonnière, not without the moving sincerity and the apostolic ardor that characterize this new great orator. He insists on the fact of universal human restlessness. He finds the cause of this in the contrast that exists between our radical frailty and our longing for the infinite, between our fundamental dependence and our need of entire freedom, between that which we are and that which we wish to be. He thus sets forth in its fullness the problem of our destiny and then strives to establish first of all that we cannot avoid it by refusing to face it, as is the case with all manner of skeptics. He finds also that no satisfactory solution is possible outside religious belief. He seeks to show the inadequacy at this point of all terrestrial social organizations, of science and even of philosophy. This latter analysis is particularly significant. Taking the monism of Spinoza and the pluralism of Renouvier as representing the two fundamental philosophical attitudes, Father Sanson criticizes them, each in turn, for their inability to bring us genuine

<sup>&</sup>lt;sup>7</sup> Paris, "Editions spes," 1925.

liberation. According to him, we can gain the infinite to which we aspire only by preparing ourselves to receive it, only by performing an inner act of religious faith which he describes in terms brief but penetrating.

There being a dearth of French defenders of radical pluralism, we may say that, with the exception of the Thomistic renaissance described above, this supernaturalism, which is based on deep searchings into human restlessness, and the monistic idealism based on the requirements of thought and defended in very different ways by a Brunschvicg and a Chartier, represent the most vital forms of religious philosophy in French-speaking countries. It is still especially Pascal and Spinoza who are brought face to face in the most modern thought—the one in a form exhibiting the influence of romantic lyricism and of the experience of spiritual leaders; the other more or less transposed into the language of Kantian idealism and of the religion of humanity. Let us now leave these regions of almost pure philosophy to see what other contemporary thinkers have derived from an empirical study of religious facts.

## III.

Religious sociology, strictly speaking, seems to have given birth in this recent period to only a very few works, at any rate to such as are synthetic in character. We may mention the work of M. Czarnowski. Studying the legend of St. Patrick, this writer has presented it as a product of the Christian churches of Ireland, creating through this epic a finer picture of their social life. Then, by means of this example, M. Czarnowski has tried to establish a connection between the cult of heroes and certain types of social structure. We may also mention the preface, in which M. Hubert has refined the solution offered by the author of this monograph, whose bent is sociological.

<sup>&</sup>lt;sup>8</sup>Le Culte des Héros et ses Conditions sociales. Saint Patrick héros national de l'Irlande, Alcan, 1919.

Much more important, doubtless, would have been the study undertaken by Robert Hertz on le Péché et l'Expiation dans les Sociétés inférieures. But this richly endowed young sociologist was killed in the war before having finished the work in which he sought to elucidate these fundamental notions of the religious life by studying them especially as they occur in Polynesian groups. Only the remarkable introduction has been published.9 Hertz here vigorously brought out the obscurity of the Christian notions of sin and of expiation and the necessity of turning to ethnology for a clarification of their genesis. But M. Mauss has been able to utilize the abundant and methodical notes which Hertz left and has himself prepared, conformably to the thought of his friend, a book whose early publication he has announced. 10 Finally, let us add that the interpreters of religious facts must henceforth take into account the already classic work of M. Levy-Bruhl on La Mentalité Primitive. 11 The author has extensively set forth the "essentially mystic" character of primitive thought, showing that it conceives all sense phenomena as manifestations of occult forces with which they continue. for primitive thought, to be inextricably interwoven.

With the strictly sociological works we may connect those of certain historians. In his ingenious little work Le mystère de Jésus<sup>12</sup> M. P. L. Couchoud, seizing with a rare talent upon the thesis of the mythologists, contends that Jesus ought not to be regarded as an historic personage but as a product of the collective mind, as a being gradually evolved by the Christian consciousness, as the result of a "collective mystic experience." Again, in his excellent work on Les rois thaumaturges,18 M. Marc Block, bring-

PRevue de l'Histoire des Religions, Jul.-Oct., 1922, pp. 5-54.
 Année Sociologique, Nouvelle Série, Vol. I, No. 1, 1925, p. 2.
 Paris, Alcan, 1922. We know that this work constitutes a sequel to the book on Les fonctions mentales dans les sociétés inferieurs, Ibid., 1910.
 Paris, Rieder, 1924.
 Publications de la Faculté des Lettres de l'Université de Strasbourg, No.
 Strasbourg and Paris, Istra, 1924.

ing a more accurate method to bear on a less elusive subject, studies the belief according to which the English and French kings enjoyed miraculous healing powers. Among the causes that have produced and maintained this belief he makes room for both collective representations and the action of certain individual will-forces, thus purposely combining the sociological explanation with what may be termed the Voltairian interpretation. We should mention above all the works of M. Alfred Loisy, especially a work such as l'Essai historique sur le Sacrifice14 which subordinates a wealth of information to a vigorous synthesis and exhibits a strong sociological interest. But since it is impossible here to devote to this work the consideration which it merits, we would do well to dwell on the book in which this illustrious exegete has set forth the ensemble of his ideas on religion.15

In this work, at once very simple, very personal and devoid of all references, M. Loisy aims to disengage the "human aspect" of religion observable alike in religion and in contemporary society. However profound may be his sentiment of universal evolution and of the transiency of all dogmas, he nevertheless believes that religion has a kind of permanent essence. What one finds as the principle of all religions is, according to him, the sense of human solidarity, the sentiment of our duty toward humanity. Such a sentiment was confusedly present even in primitive religion but it was here fused with the belief in doubles; in the course of history it became progressively clarified, and in our day it is emancipated from all metaphysical theory. But M. Loisy insists no less on the "mystic" character which this sentiment preserves and will ever preserve; by this term, deviated from its specific meaning, he designates

<sup>14</sup> Paris, Emile Nourry, 1920.

<sup>15</sup> La Religion, Paris, Emile Nourry, 1917; 2nd ed. with preface considerably revised and enlarged, 1924. We may find other small works on related subjects mentioned on the cover of this book.

a disposition of our being irreducible to reason. Faith has always been the primordial factor of religious evolution; and at bottom it is a sentiment of confidence in the future of the group. At present, Christian beliefs are being dissolved through a fatal crisis arising from the whole of social evolution. What should succeed them is not the reign of reason but a new faith, faith in humanity extolled by M. Loisy in moving terms as "the eternally true Christ, ever suffering, ever dying, ever resurrected" (p. 367).

It is clear that M. Loisy stands rather apart, as he is equally hostile to supernaturalism and to rationalism. In certain respects his position obviously approaches that of Durkheim. Both scholars agree in regarding human society as at once the origin and the true object of religion; both alike endeavor, while eliminating every trace of the transcendent, to extract from the religions of the past a degree of permanent truth. But differences appear through these agreements. M. Loisy is at once more idealistic and more anti-intellectualistic than Durkheim. He avoids, as it would seem, the equivocation inherent in the purely sociological theory of religion; the legitimate object of our worship is for him not the actual society but ideal humanity (p. 371). He has too pure and too profound a sentiment for the moral life to reduce it to the simple pressure of the collective consciousness. Perhaps one might even characterize his theory of religion as the most radical moralism which has ever existed. The sentiment of duty which he makes the common essence of morality and religion is conceived by him with no less austerity than it was by Kant. But he isolates it from all considerations both of metaphysics and of rationality. For him it has the nature of a spiritual instinct which impels the individual to devote himself to the service of humanity without hope of personal reward. The nobility of this conception is incontestable, as is also its accord with certain tendencies of modern thought. But is the interpretation faithful to the facts of religion? It must be admitted that M. Loisy exhibits far less concern than Durkheim to advance proofs. His book, *La Religion*, represents a spirited profession of faith, incorporating apt historical syntheses. But it fails to establish that the faith of the author is identical with the essence of positive religions or even that it may properly be called religion.

A fact which curiously confirms this criticism is that another historian has recently advanced a conception of life very similar to that of M. Loisy but has presented it as opposed to the religious conception. In his book, La Religion et la Vie de l'Esprit, 16 M. Paul Oltramare of Geneva, the erudite student of Indian civilization, explicitly puts this capital question: Is religion an indispensable aspect of spiritual life? When all is said and done, his answer is frankly in the negative. What he also defends is a purely human ethics; at the same time he pays a stricter regard than M. Loisy to the unique character of religion. He defines the latter as "the totality of beliefs and practices by which man expresses sentiments of reverence, of desire or of fear towards objects or beings which, though going beyond his sensible experience, he has invested with a capacity of beneficent or malevolent action" (p. 196-7). For him religion always implies belief in the reality of the transcendent. He seeks, moreover, to establish his thesis by an argument that is rather complex. He considers in turn the social and the individual aspects of religion, emphasizing the importance of the latter. He dwells alternately on the services which religion is capable of rendering to the spiritual life and on the injuries which it can cause. insists on its exclusively human origin and holds that "religious experiences" reveal no other reality than the soul of the believer. He endeavors to show that, though religion has often been beneficent, it is sometimes also harm-

<sup>&</sup>lt;sup>16</sup> Paris, Alcan, 1925.

ful and is never indispensable; it brings to man no good which he cannot obtain by other means, often to better advantage. It was the first moulding influence of the spiritual life, but we may now leave it behind and seek our ideal in the present life. . . . One sees how clear is this thesis of M. Oltramare and how diametrically opposed to that of Father Sanson. But perhaps he has set forth in a somewhat cursive manner the chief arguments on which one may lean rather than established any of them by an analysis sufficiently profound to carry conviction.

## IV.

It remains for us to consider the works of religious psychology. Such have not been lacking during recent years.

The most significant of the comprehensive works that have appeared in this domain during this period is doubtless La Religion et la Foi<sup>17</sup> by M. Henri Delacroix. We have here a methodical and detailed inventory of the principal forms of faith and connected experiences, considered in both their structure and their evolution. The work is remarkable especially for the abundance of the assembled facts, for the analyses of mental states, and for the interpretations proposed in passing. History and psychology are often brought into reinforcement, mutually enriching each other in a very happy manner. The author exhibits a live consciousness of the complexity of the phenomena which he studies, an obvious repugnance towards one-sided explanations, a constant concern for objectivity. His work. moreover, no less truly manifests a genuine singleness of spirit. At the very outset he distinguishes three principal types of faith: implicit or authoritative faith, trusting faith. and reasoning faith. This distinction corresponds to three factors which are consistently held throughout the entire

<sup>17</sup> Alcan, 1922.

volume to be at work in the religious life, the intent being not to sacrifice any of them: institution, sentiment and reason. Delacroix opposes with particular vigor explanations in terms purely of sentiment. No less truly at the basis of religion, he contends, is human desire, which creates belief in the realization of its object, and subconscious emotion. individual or collective, which confers upon this object an appearance of transcendence. To these affective states, however, one who strives for completeness must add an act of thought, belief in a certain objective order of forces or of causes. Moreover, desires and beliefs immediately give rise to a system of ritual; here lies the mainspring of cult, which preserves a degree of importance even in the most profound forms of faith. From the rite itself there is more and more completely disengaged, in the course of history, the myth, and then the dogma. Here again there intervenes an act of thought which, from the primitive notion of an impersonal and diffused religious force, presses forward to deities ever more individualized and finally reabsorbes them into the anonymity of divine infinitude. Similarly, if upon living faith there supervene dogmatic formulae, it is in consequence of the need that this faith experiences to know its own character and be founded on truth. There then comes a complex speculative development in which dogma presents itself as explanation before becoming mystery, and in which the authority of the Church finally intervenes to consecrate a protective synthesis.

We thus have a glimpse of the complex interrelations in which M. Delacroix envisages the diverse elements of faith. At the conclusion of all these analyses, so rich and so delicately demarcated, some minds cannot but put to themselves this question: What do they teach us with respect to the value of religious faith? M. Delacroix does not explicitly

touch upon this problem. Obviously, however, he seeks to present religion in its totality as a product purely of "creative faith," explicable by the general laws of the human mind and doubtless incorporating much of illusion. Moreover, however much he insists on the intellectual labor that religious faith often includes, he tends to make an absolute distinction between this faith and reason. "The faith which reason has in itself," he writes, "is not faith but reason" (p. XII). Here is an assertion singularly trenchant but in its brevity somewhat enigmatic. But this is just the kind of thesis that the author is least concerned to justify. He seeks to hold himself as closely as possible to the psychological point of view. But would not his psychology itself really have received a greater precision and confirmation if he had clearly put the epistemological problem and the metaphysical problem to which it inevitably leads, even if he did not solve them?

The same type of question will arise even more forcibly if we turn to that field of religious psychology which has been cultivated more intensively than any other in recent years: the study of mystic experience. Let us consider, first of all, the authors who, like M. Delacroix, believe themselves able to hold to an exclusively psychological point of view. La psychologie des Mystiques catholiques orthodoxes by M. Maxime de Montmorand at once comes to mind. In this interesting and richly documented work, the distinctive traits of a particular group of mystics, their ascetic method, their mystic "phenomena" and "states" are described and classified in a manner both precise and clear. But the interpretation of the facts remains somewhat too brief. M. de Montmorand undertakes to discuss especially the explanations advanced by other psychologists, and to

<sup>&</sup>lt;sup>18</sup> Alcan, 1920. Let us mention also the second edition of the book of M. J. Segond on *La Prière* (Alcan, 1925), an edition which differs from the thesis of 1911 only in a new arrangement of certain chapters and in numerous omissions.

exhibit the inadequacy of purely pathological theories. He himself connects mystic "phenomena" with the psychological state of *inspiration* without much explanation of the denotation of this latter term. As for mystical ecstacy, he insists that it affords something original but admits that it tends toward unconsciousness, and refuses, from the psychological point of view, to find in it a higher form of knowledge. In brief, M. de Montmorand has presented a convenient survey opening up the study of mysticism rather than a profound analysis of the experience.

A few attempts have been made, not in France but in Switzerland, to interpret mysticism in the light of psychoanalysis, following the example of Silberer. Flournoy has advanced an interpretation of this sort in the case of a curious "modern mystic" whom he has studied minutely with the aid of her own personal confessions.19 But the theory remains a mere outline and its application limited to the interpretation of a single case—and one altogether remarkable—whose patient and penetrating analysis constitutes the entire interest of this study. A much more systematic and comprehensive extension of the concepts dear to psycho-analysts to the interpretation of mysticism has been presented by M. Ferdinand Morel in his Essai sur l'Introversion mystique.20 Taking as his point of departure a study of the writings of Pseudo-Denys the Areopagite, he believes himself able to demonstrate that the central phenomenon among the great mystics is the attitude that Jung has called introversion; that is, the condition in which consciousness is detached from external reality and turned back upon its own functioning. This full introversion, to be found among the Indian, Alexandrian and

<sup>19</sup> Une mystique moderne (Documents pour la psychologie religieuse), in the Archives de Psychologie, Vol. XV (1915), pp. 1-224. See also Ibid., pp. 338-353. We find here some interesting remarks by M. Delacroix concerning this case which he compares to those of the great mystics of history.

Thesis presented to the University of Geneva, Kündig, 1918.

"speculative" mystics, itself results from a fundamental narcissism. Among female mystics, on the other hand, auto-eroticism predominates. Finally, the mystics called "orthodox" represent an intermediate type. At the basis of the two extreme types one may find a common element, namely, a sexual mal-adaptation resulting in a shift of attention toward the unconscious pole of the mental life. We have here, it is obvious, an unusual conception of the mystic experience. But one must confess that the interpretation seems both too arbitrary and too superficial. To us it appears probable that psycho-analysis can throw some light on this obscure region, but only on condition that it operate with the aid of less rudimentary concepts. In their excessive brevity the interpretations of Flournoy embodied the promise of an explanation more richly shaded.

Of the theories advanced from a purely psychological point of view, the most complete apparently continues to be that of M. Delacroix. In his Etudes of 1908, he described the stages of mystic development as subject to laws representing internal determinism, in part subconscious, tending, moreover, to a progressive enrichment of the personality. It is by this hypothesis of the subconscious, borrowed from William James, that he explained in particular the feeling of passivity common to mystics. At the same time, however, he insisted on the control exercised by intelligence over their experience. In his more recent publications21 he has presented a new analysis of the mystic ecstacy in its totality. He represents it as consisting fundamentally of "a confused exaltation illumined by a spiritual interpretation." At its basis there is thought to be a sort of indeterminate effusion of love closely kin to that which gives birth to lyrics or to music, but in the case of the mystic

<sup>&</sup>lt;sup>21</sup> See La Religion et la Foi, Vol. II, chap. 1; the article mentioned in the Archives de Psychologie; and finally, the remarks concerning the thesis of M. Baruzi, Bulletin de la Société française de Philosophie, May-June, 1925, pp. 33-42.

there is also a metaphysical schema resulting from speculations on the infinite and ineffable deity. Thus the mystic experience appears to the eyes of a psychologist not as a simple intuition but as a very complex synthesis of intellectual and affective motifs governed by an effort on the part of the individual to identify himself with the principle of the universe. Psychology thus shows "the profoundly human character" of the mystic experience without, however, being able to decide on its ontological value.

Recently another investigator has sought, with the aid of a peculiarly privileged subject, to clarify not only the psychological nature but, as he calls it, the "noetic value" of the mystic experience. M. Jean Baruzi has consecrated to this purpose a voluminous, learned and penetrating study of St. Jean de la Croix.22 One may not praise too highly the wealth of his information and the pithiness of his analyses. As to the conclusion which he endeavors to derive, this does not always stand out with perfect clarity. But the following is what seems to us to be essential in it. Through the depth of his mystic experience, St. Jean de la Croix, realizing in himself the universal and permanent conditions of union with the divine, was led to a true intuition of a metaphysical import, namely that of the absorption of the soul into a deity without modes. Thus he implicitly went beyond not only the scholastic psychology which he had received from tradition without changing it, but even beyond Christianity; he has led without realizing it into a form of "intellectualistic idealism" in the manner of M. Brunschvicg. . . . We here have, as may be seen, one of the most engaging efforts to free the intuition of a mystical genius from the inadequate interpretation which it had given of itself under the dominance of the traditional

<sup>&</sup>lt;sup>22</sup> St. Jean de la Croix et le problème de l'expérience mystique, Alcan, 1924-5. Also the communication of M. Baruzi to the Société française de Philosophie, St. Jean de la Croix et le problème de la valeur noétique de l'expérience mystique (Bulletin cited in the preceding note).

categories, 22 and the thesis, though based on the analysis of a single case, nevertheless contains a thought of universal bearing. M. Baruzi holds that the mystic experience possesses an irreducible originality, that it yields real "insights" independent of the religious form to which it may be bound solely by an accident of history, that it reveals a new relation between the spirit and things. We have here a thesis strikingly original but which still awaits—M. Baruzi himself recognizes this—its complete demonstration. What seems a bit disappointing in the work already accomplished is the fact that from the experience of St. Jean, described at such length, one retains a noetic residue so slight and so little different from that which others have obtained by means of a completely abstract dialectic.

There are other authors who have expressly shown that if one would penetrate to the bottom of the mystic experience, one must examine it in connection with the general conditions of human knowledge. This demonstration has been undertaken in two rather different ways by Father Joseph Maréchal and by M. Maurice Blondel. The former, in his very interesting *Etudes sur la Psychologie des Mystiques*, <sup>24</sup> sets forth with much accuracy the complex conditions that come into play in the interpretation of mystic states. He disengages the principal types of ex-

<sup>28</sup> It goes without saying that this interpretation of St. Jean de la Croix has been challenged. See in particular the profound discussion of Father Laberthonnière (Bulletin cited above, pp. 43-75). According to him the spiritual life of St. Jean de la Croix surpasses and sometimes contradicts his scholastic language, but not true Christian tradition; he conceives the mystic ecstasy not as an absorption of the soul into a universal substance, but as the union of two beings based upon the reciprocal giving of self prepared for by the practice of generosity. See also for a closely related article that of M. Joannès Wehrlé, La vie et la doctrine de St. Jean de la Croix (Cahiers de la Nouvelle Journée, No. 3, Qu'est-ce que le Mystique? Paris, Bloud et Gay, 1925, pp. 124-169). M. Wehrlé sees in the doctrine of St. Jean both a development of evangelical thought and a sketch of the philosophy of action. For an article in the more traditional sense, see the critique of M. Baruzi's book by the monk of Solesmes, Ph. Chevallier, La Vie Spirituelle, 1925, XII, pp. 188-212.

<sup>&</sup>lt;sup>24</sup> Vol. I, Bruges, Ch. Beyaert, and Paris, Alcan, 1924. This volume contains articles published in 1908-9 and 1912.

planatory hypotheses, recognizing that the strictly empirical theory carries a "presumption of authority" based on the methodological principle of the economy of thought, but he himself inclines to the doctrine according to which mystical ecstasy affords a true intuition of being, due to the action of God wherein he reveals himself to certain souls. To the support of this thesis he adduces the testimony of the mystics themselves, the conclusions which he believes to be established by metaphysics, but especially the general psychology of human intelligence. That which, according to him, characterizes this intelligence in all its activities is the need of affirming being and of achieving unity. In the realm of natural knowledge, namely that of sense perception and of multiplicity, this need cannot be completely satisfied. Our spirit can realize its deep aspiration only if, thanks to the intervention of an external power, it attains to an intellectual intuition of being. Such precisely is mystical ecstasy; though surpassing the powers of mere intelligence, it is merely a projection of the essential movement characteristic of the latter.

This conception of mental dynamism represents a loan from the Thomistic psychology, in which one discerns an echo of Plotinus and even of Plato. In the present case, however, it is weakened by the idea that human knowledge is naturally imprisoned within the circle of the sensible. M. Blondel has based a rather similar glorification of mystic union on a theory of knowledge much more complex and original. In his remarkable contribution to the volume, Le procés de l'Intelligence, be has advanced the important thesis that our intelligence, over and above notional knowl-

<sup>&</sup>lt;sup>25</sup> Le Procès de l'Intelligence, by P. Archambault, M. Brillant, P. Gemahling, L. Ruy and M. Blondel, Paris, Bloud et Gay, 1922. These studies had previously appeared in articles in the Nouvelle Journée. M. Blondel here names St. Augustine, Pascal and Newman as the principal upholders of the conception which he develops. In another work he points out also a more precisely worked out expression of this in the work of his master Ollé-Laprune: See Ollé-Laprune, L'achevement et l'avenir de son oeuvre, Bloud et Gay, 1923.

edge, is able to form and to develop what he calls real knowledge or knowledge by connaturality. This latter form of concrete thought which tends to the possession of being in its character of a totality comprising particularity and wholeness, rests on a natural affinity which causes us to vibrate in unison with others and is developed by a spiritual culture which progressively frees us from egoism and actively harmonizes us with other beings. This knowledge, requiring for its exercise the co-operation of all our powers of action and feeling, and likewise possessing a rational and objective character, represents, according to M. Blondel, the point where mysticism inserts itself into human life. This is the doctrine defended in a very complicated but substantial study, Le problem de la Mystique.26 Real knowledge puts us into communion with integral reality, but in a manner always imperfect. It tends to unite us to the principle of being, but by itself alone cannot consummate this union, for God is not an object who may thus be laid hold upon. Mysticism yields the only truly satisfactory reply to the question that reason puts but cannot answer. Human knowledge in all its forms ultimately leaves a void; the contemplative union enjoyed by the mystic alone yields true satisfaction. Though irreducible, and different from the ordinary experiences of life, this state is nevertheless in continuity with the latter, "being a direct prolongation of the line pursued by our knowledge and our action" (p. 454). It involves a divine grace that is incommensurable with human achievements and that may nevertheless, even in its most exalted forms, to a certain extent be apprehended by reason. It is the complete realization of the human ideal, and even, in a strict sense, of the philosophical ideal. It is "the perfection of the spirit" (p. 62). This is an important contention, of whose justification, how-

<sup>&</sup>lt;sup>26</sup> In the Cahier already cited: Qu'est-ce que la Mystique? pp. 1-63.

ever, M. Blondel has up to the present attempted only a sketch.

Thus the psychology of religious phenomena in their profounder phases leads to conclusions no less divergent than those of the purely philosophical study of religion. Nevertheless the former offers at least the advantage of turning our thought towards facts, doubtless difficult to grasp, yet rich in substance. Another aspect of the subject—and one too long neglected—has been explored in an interesting way by two Protestant authors. I refer to the religious sentiments of childhood. M. Henri Clavier, utilizing numerous and exact observations, has written on l'Idée de Dieu chez l'Enfant.27 M. Pierre Bovet, in his little work le sentiment religieux et la Psychologie de l'enfant<sup>28</sup> has presented a completely individual analysis of the same subject. He seeks to show that the "adoration" manifested by the small child toward his parents is "the prototype of religious sentiments" (p. 46). And he describes in a very curious manner the process by which this filial love is transferred from the parents to God, a process observable in its spontaneous form in the case of deaf and dumb children. M. Bovet likewise shows that, in spite of frequently bizarre ideas of God, children are capable of religious experiences that are "at times singularly lofty and profound" (p. 93), whether in respect to the mystical or the moral aspects of religion.

Finally, a completely new field of religious psychology has been opened up by M. Raoul Allier in his work la Psychologie de la Conversion chez les Peuples non civilisés, 29 a study long in preparation, based on the narratives of

Thesis defended before the Faculté libre de théologie protestante of Montauan, 1913, 2nd ed. enriched by note and appendices, Paris, Fischbacher, 1926. The same author has published l'expérience de la Vie Eternelle, Fischbacher, 1923. In this book he pretends to establish the reality of a beautiful experience reached by "personalistic mysticism" which is supposed to have attained its perfect form in Jesus. Unfortunately this important thesis is defended by a very superficial argument.

<sup>&</sup>lt;sup>28</sup> Neuchatel and Paris, Ed. Delachaux et Niestlé, 1925.

<sup>&</sup>lt;sup>29</sup> Two volumes, Payot, 1925 and 1926.

Protestant missionaries and indeed full of interest but too recent to permit of analysis here.

## V.

During this brief period, unusually broken into and impoverished by the war, we find that religious problems and phenomena have nevertheless given rise, in France, in Switzerland and in Belgium, to not unimportant works, especially in the psychological domain. And we could still further notably prolongate our list if we would mention the more specialized studies from which the philosophy and the psychology of religion can derive profit. Let us at least here mention two works no less different in the spirit of their authors than in their dimensions: the documented and shrewd biography presented by the late Albert Houtin of an abbess of Solesmes30 and the comprehensive Histoire littéraire du sentiment religieux en France depuis la fin des querres jusqu'a nos jours edited by M. Henri Bremond with as much of talent as of erudition.31 May I direct attention also to the voluminous work devoted by Father Pinard de la Boullage to L'éstude comparée des religions. 32 a book so rich in objective and well classified information that it has been highly praised by a critic as little liable to partiality towards a Jesuit as the aforesaid Houtin? 33 During this same period there have been established at least four new reviews devoted to the religious sciences, two of which specialize in the problems of asceticism and mystic-

<sup>&</sup>lt;sup>80</sup> Une grande mystique. Madame Bruyère, abbesse de Solesmes (1845-1909), Alcan, 1925. This volume contains a long memoire in which Dom. Sanson denounces "the folly of pride and of mystic delirium" which the abbess had communicated to the monks of Solesmes.

<sup>&</sup>lt;sup>31</sup> Six volumes, Bloud et Gay, 1916-1922. One might regard as similar the book of P. Pourrat on la Spiritualité Chrétienne, 3 vols. 1918, 1921 and 1925.

<sup>&</sup>lt;sup>82</sup> 2 Vols.: I. Son histoire dans le monde occidental; II. Ses mèthodes, Beauchesne, 1922 and 1925.

<sup>88</sup> Revue d'Histoire des Religions, 1923, p. 282.

ism.34 No less significant, along its own line, is the success of such series as Christianisme, 35 Judaisme, 36 and Maîtres de la Pensée Antichrétienne.87 Perhaps the very wealth of the materials amassed in the field of religious phenomena has begun to make their synthetic utilization singularly difficult. It must be acknowledged that, as regards religious philosophy, this last decade is far from having given birth to as many good original works as the preceding quarter-century. The strictly philosophical works which we have mentioned are all of the nature of popularizations or of brief sketches. Most of them present in a new form ideas that had already been advanced. The only exceptions are the publications of M. Loisy and of M. Baruzi for, even though the one writer approximates the sociological thesis and the other the idealistic view, both exhibit a peculiarity, rare in France, namely, that of ascribing an irreducible value to both religious and mystical experience without adhering to any kind of orthodoxy.

But, truth to say, the period which we have studied appears to us more valuable for what it paves the way to than for what it itself contains. Not only does it afford many signs of its own interest in the study of religious facts but there are reasons for believing that important synthetic works are about to see the light. We have already mentioned the promise of M. Mauss and we expect that

These latter two are the Revue d'Ascétique et de Mystique, founded in 1920, and La Vie Spirituelle Ascétique et Mystique, founded in 1919. The former, more speculative in character than the latter, contains carefully worked out articles and accounts. The two other reviews come from the University of Strasbourg: the Revue d'Histoire et de Philosophic religeuses, founded in of Strasbourg: the Revue a Histoire et de Philosophic religeuses, founded in 1920 by the faculty of Protestant theology, and the Revue des Sciences religieuses, founded in 1921 by the professors of the faculty of Catholic theology. Both are very important. Let us mention also la Nouvelle Journée, the valiant organ of the Catholics who favor the philosophy of action, founded in 1919 and discontinued in 1924 in order to give place to the Cahiers de la Nouvelle Journée. Nouvelle Journée.

<sup>85</sup> Published by Rieder.

<sup>&</sup>lt;sup>86</sup> Published by Rieder.

<sup>87</sup> In the Editions du Siècle.

his collaborators will soon give a new lease of life to religious sociology. Will not M. Levy-Bruhl one day complete his account of primitive mentality by a work seeking to trace its genesis? As to religious psychology, it is in too vigorous a swing to stop now. We await with impatience the conclusion of the studies of Father Maréchal, the book in which M. Baruzi will develop his conception of a mystic experience, and the treatise which M. Pierre Janet is preparing and to which he has already given the title: De l'angoisse à l'extase. 38 Finally, with strict reference to philosophy, the most vigorous thinkers are far from having spoken their last words. M. Blondel is announcing the early publication of several volumes: La Pensée, L'Etre and L'Esprit Chrétien. M. Le Roy, who has during recent vears attacked the whole of the religious problem in some remarkable lectures, is working at a more complete exposition of his own philosophy. We hope that circumstances will soon permit Father Laberthonnière to publish the works composed during thirteen years of silence. Finally, M. Brunschvicg ought to give us a thorough and independent treatment of the problems which he has only touched upon in passing or by way of conclusion from other studies.

Most certainly we find ourselves in the presence of irreconcilable differences. In this field more than in all others it seems impossible to eliminate the personal factor. Among the readers of this very article will not more than one regret that we have judged too favorably this or that work whose tendency displeases him? What is now important is that the various thinkers submit their personal convictions to the double proof of observable facts and of opposing doctrines. This is a work already largely begun, and not without gain, but which it is necessary to push even further. Indeed, although a certain division of intellectual

<sup>&</sup>lt;sup>88</sup> He has published a chapter of it in the Journal de Psychologie normale et pathologique, May 15 and June 15, 1925.

labor is here as everywhere imperative, nothing would be more pernicious than to confine the different theories in separate enclosures or to establish a barrier between the empirical study of religious facts and the philosophy of religion. Perhaps some of the authors whom we have mentioned have never elsewhere than in these pages been brought together and yet they all discuss one and the same subject. Never will a psychological or social interpretation of religious facts dig at all deeply without striking the metaphysical problem; and never will a solution of this problem have force if it has not drawn heavily upon experience. In the last analysis one must always confront the given facts of history and of psychology with the total requirements of the spiritual life, a task which does not exclude the most daring of personal interpretations, provided one is conscious of their character and is concerned to distinguish the different stages intermediate between opinion and certainty.

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## THE THEORY OF SENSA: AN ASPECT OF CURRENT REALISM

In the second part of his Scientific Thought Dr. Broad has set forth a view of the nature of sensible appearance which he calls the Sensum Theory. Other thinkers, notably Mr. Bertrand Russell, had previously advocated a view of the same type, but it has remained for Mr. Broad to work it out in detail and present us in its terms with a systematic exposition of the nature of the external world. Apart from its intrinsic interest this theory is significant as one of the latest developments of the realistic tendencies of recent philosophical thought. In the present paper I propose to attempt an examination of some of its main features and to suggest some considerations which seem to me to be fatal to it.

Mr. Broad offers his theory as a solution of certain contradictions, or at least discrepancies, revealed in our ordinary perceptual judgments. "Difficulties always arise when two sets of properties apparently belong to the same object, and yet are apparently incompatible with each other. Now the difficulty here is to reconcile the supposed neutrality, persistence, and independence of a physical object with the obvious differences between its various sensible appearances to different observers at the same moment, and to the same observer at different moments between which it is

held not to have undergone any physical change. We know, e. g., that when we lay a penny down on a table and view it from different positions it generally looks more or less elliptical in shape. The eccentricity of these various appearances varies as we move about, and so does the direction of their major axes. Now we hold that the penny, at which we say that we were looking all the time, has not changed; and that it is round, and not elliptical, in shape. The difficulty is to reconcile the different appearances with the supposed constancy of the penny, and the ellipticity of the appearances with the supposed roundness of the penny." (pp. 234-5.) We do not get rid of the difficulty by saying that appearances are unreal. "If an appearance were unreal, nothing would appear, and if nothing appeared, there would be nothing for scientific theories to account for." (p. 242.) In some sense, then, appearances are real. On the other hand, what we commonly take to be real—e. g., the roundness of the penny—is, whatever more it may be, an appearance. What, then, do we mean by saying that, though the penny sometimes looks round and sometimes elliptical, it really is the one and not the other? May not the answer be that another sense, the sense of touch, supports the visual impression of roundness and discredits that of ellipticity; and that, on account of its practical importance, we make this sense our test of reality? In other words, the evidence of one sense would be confirmed or disallowed by the evidence of another sense, and not by reference to some criterion other than either of them. This suggests that what we call a physical object may be simply the sum of all the different appearances which, as we should say, it presents to our different senses. This is Mr. Broad's solution of the difficulty. He holds that appearances are themselves objects, apprehended in "acts of sensing;" and such objects he calls "sensa."

A sensum is related to other sensa in the same sense-field. but between sensa in different fields, e. g., between visual and tactual sensa, there is no intrinsic connection. It is our minds which co-ordinate groups of visual, tactual and other sensa with one another, and so come to form the notion of perceptual objects. The question arises whether such a transition from awareness of sensa to belief in perceptual objects is possible. Mr. Broad holds that it is, and devotes a large part of his book to a detailed account of the manner in which he supposes this process to take place. It seems to me that here he has attempted an impossible task -impossible because the objects of the different senses have been separated so completely that they can only be brought together again by illicitly introducing an aspect of unity which has been formally denied to them. I shall try to show that Mr. Broad's account is open to this objection.

The separation between the elements which constitute the objective side of experience is paralleled by an equally rigid severance between its subjective factors. The mental processes which yield us our perceptual world are sharply contrasted with the acts of sensing which provide those processes with their data. Thought and sensation are not, for the sensum theory, distinguishable but inseparable aspects of experience; they are different mental facts. From such a standpoint it is not surprising to find that the transition from sensation to thought is regarded less as the development of our knowledge of a real world than as the formation of the idea of a fictitious one. If we hold that this view of the nature of experience is erroneous, we shall expect to find (and I shall try to show that we do find) that here too the aspects which have been neglected take their revenge on the theory by insinuating themselves unobserved into its texture.

The criticisms I wish to make on the sensum theory may

be summarised in three propositions, which I shall discuss, as far as possible, separately: I. Analysis of sensible appearance does not reveal any such objects as sensa. II. The sensum theory can only obtain certain results by making percepts do the work of sensa. III. The account of the transition from sensa to perceptual objects is vitiated by assuming these results and by the illicit use of the notion of correlation.

Ι

In the first place, we must agree with Mr. Broad that sensible appearances, if not, as he claims, as real as anything else, are at least in some way real. But when he identifies sensible appearances with sensa, i. e., with objects of acts of sensing, he cannot expect such ready assent; for it may be urged that pure sensation is the figment of an obsolete psychology. And if there is no such mental fact as an act of sensing, what becomes of its object, the sensum? It seems unfortunate that the sensum theory should have to stand or fall with so dubious a concept as that of pure sensation.

It is, however, for the moment, more to my purpose to examine the sensible appearances themselves, than to inquire into the nature of the mental process by which they are apprehended. If we are to be asked to regard these appearances as objects of which we become aware in the process of sensing, we ought to be left in no doubt as to what is to be taken as *one* appearance or sensum. Mr. Broad works with the sensum as the physicist works with the atom, and we have a right to expect from him as definitive an answer to the question "What is one sensum?" as the physicist would give to the question "What is one atom?" But for such an answer we look in vain. Mr. Broad, indeed, appears to determine his sensa not by analysis of sense-fields but by reference to physical objects. A certain

brown, elliptical portion of the visual field is distinguished from its surroundings and regarded as a sensum because it is believed to be the appearance of a penny. This is unsatisfactory. If the limited sensum, as distinguished from the whole sense-field, cannot be defined except by reference to a perceptual object, then the perceptual object is logically prior to the sensum and not vice versa. And it would seem that in no other way can the limited sensum be defined. Examination of our sense-fields themselves gives us little help. The visual field, for example, is sensibly continuous throughout, and does not lend itself to attempts to analyze it into a number of units. We may, indeed, if we so choose, regard a visual field as made up of parts; but if we do so, there is not one way only, but an indefinite number of ways in which we may divide it. And each of these parts is itself a limited visual field which we may subdivide further. We can only reach true units by abandoning the principle on which the sensum theory is based that of taking appearances at their face values. The penny may consist of atoms, the space which it occupies may consist of points, but we do not sense atoms or points. If then we are to accept the evidence of sense, we cannot recognise as a unit anything less than a whole sense-field. But such a unit is unmanageable. It must be considered as if it were made up of smaller units if the theory is to be got to work at all. That element of fiction, then, which. according to Mr. Broad, enters so largely into the constitution of the physical object, is also present in the units into which he would dissolve it.

Mr. Broad's treatment of the status of the limited sensum is inconsistent. In general he speaks of sensa, and makes use of them, as if they were true units which we discover in sensible appearances. But in one or two passages he recognises that they are only portions of sense-

fields. "I define a sensum as a part of a sensible field" (p. 384); "Sensa are simply outstanding features in sensefields" (p. 517). These are not helpful statements. Mr. Broad does not seem to realise that the persuasiveness and even the intelligibility of his theory largely depend on our being able to take the sensum as a real unit, and that they tend to disappear if we find that it is only a vaguely defined portion of a sense-field.

Fresh difficulties arise when we take the time factor into account. Here, too, there seems nothing in the nature of the appearances themselves to indicate when one sensum ends and another begins. The concept of the Specious Present, whatever its psychological value, does not help us here. For time, as we apprehend it, does not consist of a series of atomic specious presents; the fact is rather that these flow into one another in such a way that any duration less than a specious present may be taken indifferently either as the later part of an earlier, or as the earlier part of a later, specious present. The only ground for holding that a new sensum has taken the place of an old one would appear to be a change of quality. But change is usually gradual and continuous rather than sudden and catastrophic; and the theory is therefore faced with the question: Is any change, however slight, to be taken as creating a different sensum? I will quote Mr. Broad's answer. "I have not considered that complete identity of place, shape or sense-quality is essential to the identity of a sensum. I therefore recognise the identity of sensibly moving and sensibly changing sensa. . . . Anyone who disapproves of it has merely to make appropriate modifications in his definition of the word sensum." (p. 357.) Here again is the same vagueness in the determination of the sensum which we found in the treatment of its spatial limits. We are at liberty to admit a larger or smaller

amount of change into the constitution of a single sensum according to our individual notions as to the most convenient method of division: the facts themselves impose no one course on us. This is surely unsatisfactory. The aim of the theory is to distinguish the fictitious, or what Mr. Broad calls the "Pickwickian" elements in the concept of a physical object from the sense-units of which the object is actually composed. But are not units that we can modify in this way to suit our convenience in arranging our data equally open to the charge of existing only in a Pickwickian sense?

Mr. Broad's own choice here, as we have seen, is to regard some small amount of change as possible within the limits of a single sensum. But he does not hold consistently to this view. He tells us frequently elsewhere that when a sensum s appears to undergo a continuous change, what really happens is that we apprehend a succession of sensa s<sub>o</sub> s<sub>1</sub> . . . . s<sub>n</sub>, each a little different from the preceding one. Both views are open to serious objections. The second one is refuted by examination of the experience itself. In such cases as we are considering—e. g. when a visual object seems to grow larger as we approach it—we cannot regard the process as made up of parts. The difficulty is the same as that which we found in considering the extensiveness of sensa. We can divide the total appearance neither into a finite nor an infinite number of units: for any division into a finite number would be arbitrary. while infinitesimals are not sensed at all.

While this interpretation of the process of change mutilates the facts, it is at least consistent with Mr. Broad's original definition of the sensum. The alternative view, in which he states that change takes place in the sensum itself, seems to me to be inconsistent with that definition and with the theory based on it. For the sensum is defined in a way

which makes it necessarily a static object: it is a certain appearance only—just this appearance and not that. How can change take place in an object so defined? If I turn a penny between my fingers so that it looks at first elliptical and then round, the ellipse and the circle are different appearances. They should therefore be different sensa, since sensum and appearance are two names for the same thing. This is of course Mr. Broad's own solution of the difficulties in our judgments about physical objects. Yet for the view we are at present considering, this would be a typical case of a single sensum containing change within itself. The two appearances are therefore different sensa and yet one sensum.

There seems to be only one possible way of escaping from this contradiction, namely by admitting into the concept of sensum some other element besides that of appearance. The *impasse* in which the theory here finds itself suggests that in speaking of appearance, apart from anything that appears, we are not getting down to hard fact but dealing with an abstraction. But if the necessary modifications were introduced into the concept of sensum, the result would be that the theory would be transformed beyond recognition. For in the first place, the alterations would entail the reversal of a principle which underlies Mr. Broad's whole treatment; while in the second place the term sensum, with its implications, would have to go.

To take the first point: the principle constantly applied by Mr. Broad is that in every object which seems to contain different elements all that is to be taken as real is the different elements considered severally, the unity between them being contributed, or imputed to them, by our minds. The concept of identity in difference is valid only in a "Pickwickian" sense. It has no root in reality, but is a device which we use to enable us to look on masses of heterogeneous entities as if they constituted one object. It is to be noted that it is only on the assumption of the truth of this view that the difficulty which gives the point of departure for the sensum theory amounts to a contradiction. Mr. Broad admits that this difficulty may be soluble in other ways, for example by the Multiple Relation Theory. His preference for the sensum theory seems to be due to the fact that it offers a possibility of avoiding the use of the concept of identity in difference, while the other does not. However this may be, when once this theory is adopted, that concept is automatically excluded. For example, while it is impossible that a penny should be both round and elliptical in the same sense, there is no reason from the commonsense standpoint why it should not be both round and hard; but the sensum theory leaves us no option but to say that there are two objects, one round, the other hard. Yet we have seen that in asserting that a sensum may change and yet remain the same sensum, the theory has to recognise that in such cases sensible differences are not incompatible with an identity of some kind

It may be added that the mere admission into the concept of sensum of another element besides that of appearance would in itself be a denial of the principle which guides Mr. Broad's usual procedure. For on that principle the sensum as newly defined should then consist of appearance plus the new element. If the sensum were thus disintegrated, the difficulties would break out afresh; if it is left integral, the guiding principle has been abandoned.

Secondly, if the sensum were re-defined in such a way as to provide for its maintaining its identity while undergoing change, the theory could hardly fail to take on a very different aspect. For one thing it would lose its clear-cut

definiteness of statement: its outlines would cease to be sharp and would become blurred and indistinguishable. There is an attractive simplicity about a view which tells us that the way of escape from the difficulty of holding that an object may be both round and elliptical is to recognise that the round appearance and the elliptical appearance are not attributes of the one object but are themselves objects. But we are thrown back into confusion if it is added that the round appearance may become elliptical and the elliptical appearance become round. The notion of sensum as bare appearance having been abandoned, how is the theory to define the elements into which it would decompose the perceptual object? I cannot see how this question is to be answered. It was the static nature of the appearance which enabled it to be used as such a unit. Its identity consisted in its being just such-and-such an appearance; the slightest change brings about a different appearance, similar to the previous one, no doubt, but necessarily not the same. The recognition of the fact of continuous change as a process which cannot be split up into a succession of such static units, each differing in a minute degree from the preceding one, shows, as we have seen, that these bare appearances are abstractions from the sensible facts and not the elements of which those facts are composed.

Let us see how Mr. Broad deals with this question of the limits of the changing sensum. "It might happen that, as we divide up the sensible field into successive thinner sections, we find that in each section there is a sensible field occupied by the same sense-quality. Moreover, the shapes of these sensible places might be indistinguishable. But the sensible places occupied by this quality in successive sections of the sensible field might differ. And it might be found that the thinner we made the sections the more nearly alike were the sensible places occupied by this quality in adjacent sections. On the grounds of this con-

tinuity of place and identity of shape and sensible quality, we should be justified in saying that we were dealing with a single sensum, which persists throughout the whole of the sensible field. In real life it is unlikely that the shapes of the successive places would be exactly alike, or that precisely the same sense-quality would occupy each of them. But, provided that the change of shape and of sense-quality was continuous in the sense defined above, we should still say that we were dealing with a single sensum; but should add that it changes sensibly in shape and quality as it sensibly moves." (p. 356.) This statement, however, does not meet the needs of the case. The identity of shape and sensible quality is a matter of degree: we sometimes find more, sometimes less. Within certain limits of change we may speak of one sensum, beyond those limits we have different sensa; but where, or on what principle, to assign those limits, Mr. Broad does not tell us. It is, as we have seen, a question which each of us may answer differently to suit his own purposes; we can extract no answer from the facts themselves.

Let us assume, however, that we have decided on some method of delimiting the sensum. The question now arises whether "sensum" is not an inaccurate and misleading term for the objects with which Mr. Broad is concerned in the passage I have just quoted. For a sensum is an object of an act of sensing; and the mental activity involved in the apprehension of a process of change is something more than sensing. It is essentially a perceptual activity. This brings me to the second part of my inquiry.

II

Let us consider movement, as a special case of change. We are told in the foregoing passage that we sense movement. This, I think, is a mistake. We certainly *see* movement, but that is not the same thing. Let us take a case

from Mr. Broad where obviously more is implied than sensing. "It is a notorious fact that we do not merely notice that something has moved or otherwise changed: we also see something moving or changing. This happens if we look at the second-hand of a watch or look at a flickering flame. These are experiences of a quite unique kind; we could no more describe what we sense in them to a man who had never had such experiences than we could describe a red colour to a man born blind." (p. 351.) This is clearly not a purely sensible, but a perceptual experience. We see the second-hand moving, and do not merely sense it, because the second-hand is not a sensum but a perceptual object. But let us forget that such a physical object as a watch is before us and reduce the experience to its simplest terms. Let us ask what is implied in the most rudimentary awareness that something is moving. First let me remind the reader that Mr. Broad holds that at the sensible level the formal and the material aspects of a sense-field—for example, visual extension and the coloured objects which, as we say, fill it—are not distinguished from each other. And further, when we do come to separate them in thought, we are, in his view, not gaining further insight into reality, but taking the first step from the real world of sensa into the factitious world of physical objects. Now it is evident that in the most primitive apprehension of motion we must already have taken this step. "That is moving from there to there: where all was white before, it is now partly black." The most elementary awareness of motion must involve some such recognition. We have here, therefore, though as yet only in terms of one sense, the rudiments of a perceptual object in a perceptual world: an ob ect which retains its identity through change, in an environment in which those changes take place. If the question be asked: What then are the sensible facts which appear on the perceptual

level as awareness of motion, the answer, of course, is that my whole contention is that there are no merely sensible facts. What we call sensible appearances always involve more than sensing.1

It is remarkable that Mr. Broad himself gives instances which illustrate the impossibility of isolating the sensible from the perceptual elements in experience, without apparently realising how damaging such facts are to his position. I will quote two of these. "When I look at the 'staircase figure' which is given in most psychology textbooks as an instance of ambiguous figures, it seems to me that it actually looks sensibly different from time to time. Its sensible appearance changes 'with a click,' as I look at it, from that of a staircase to that of an overhanging cornice. This change tends to take place as I concentrate my mind on the idea of one or on that of the other.2 Now, on the present analysis of sensible appearance, such a change as this involves an actual qualitative change in the sensum. So far is it from being a mere change in the judgments which I happen to base on one and the same sensum that the direction of my thoughts changes first and is the condition of the change in the sensible appearance." (p. 260.) "When I believe that the object I am looking at is the sort of object that will not move, and when I am sensing it under normal conditions, the sensa keep still, in spite of the movement of the stimulus, provided this movement is caused by the voluntary turning of my head. Thus it seems to me to be clear that one condition which partly determines

<sup>&</sup>lt;sup>1</sup> Compare on this whole question H. N. Randle in *Mind*, July, 1922.—
"The entirely gratuitous difficulty which is often felt about the perception of motion, in particular, simply arises from the substitution of sense-data for the motion, in particular, simply arises from the substitution of sense-data for the truly functional thought-element, the sensible appearance. There can be no sense-datum or impression of movement, because the sense-datum, like the individual cinematograph film, stands for a moment of rest, and though you may attempt to counterfeit continuity (as the cinematograph does) by filling the interstices of your fragmentary sense-data with an infinity of sub-conscious impressions or petities perceptions, you will never succeed in passing from instantaneous immobilities to a moving continuity."

<sup>&</sup>lt;sup>2</sup> My italics.

the present motion or rest of my visual sensa is my beliefs as to the motion and rest of the objects of which these sensa are appearances. These beliefs must be due to past experiences, not wholly visual, in connection with similar sensa." (p. 288.) The awkwardness of such facts for the sensum theory is obvious. Physical objects, we are told, are made up of sensa, but we now see that some sensa, at least, are partly dependent on our perception of physical objects. In so far as these sensa are concerned, the theory moves in a circle. Such sensa are useless for Mr. Broad's purposes. But how are pure sensa to be distinguished from those with this perceptual ingredient? How can we be sure that any are above suspicion?

Mr. Broad's discussions of the problems of visual solidity and visual distance yield further evidence of the difficulty of disentangling purely sensed elements from the perceptual context in which they appear. One result of these discussions is to bring out the fact that "the past history and present expectations of the percipient must be supposed to be partial conditions of some of the qualities and relations of sensa. This cuts out at once any of those cheap and easy forms of naïve realism which are produced in mass and exported in bulk from the other side of the Atlantic." (p. 299.) Excellent, if only it ended there! But unfortunately it also seems to go a long way towards cutting out the sensum theory itself. Sensa which are conditioned by the past history and present expectations of the percipient do not answer the requirements of that theory: it can only use as data those which are free from this perceptual taint.

Such sensa Mr. Broad would find in the phenomena of visual solidity and depth. He says "I find it very hard to believe that experiences of touch or movement could *create* a third dimension in visual sensa which originally had only

two." (p. 290.) Again, visual solidity "does not consist of visual flatness together with judgments about past or future tactual sensations." (p. 291.) On this we may reasonably ask whether there is anything more remarkable here than in any recognised case of "complication." "Ice looks cold because we have felt it to be cold. . . . Yet its cold look is not a suggested idea; nor is it a distinct temperature sensation. It is something which is included in the visual appearance as an integral part of it." (Stout, Manual, Bk. I. Ch. II. 10.) Mr. Broad, I suppose, would take no exception to this statement; nor would he draw the conclusion that temperature is an original quality of visual sensa. If our tactual experiences can produce an effect of visual coldness, why should they not also produce an effect of visual solidity?

Further, there is a kind of petitio principii lurking in Mr. Broad's argument. He assumes that solidity must either be in the sensa or be the result of a judgment. But the disjunction here is only an exhaustive one to those who have already accepted his thesis that perceptual experience consists of sensa plus judgments about them. It is open to those who do not assent to this thesis to hold that solidity is neither a quality of a visual sensum nor the object of a judgment. It has been held, for example, that space is not an object of sense but of intuition. If this be so, there is nothing incredible in the supposition that the visual sense may provide us with the material filling for two dimensions of space only. The question could only be settled by a careful examination of the visual appearances, so far as we can attend to them apart from the perceptual contexts in which they are found. In so far as this can be done, the result would seem to be that the impression of solidity and depth is greatly lessened, while it returns again in full force as we return to a normal perceptual outlook. There are other facts which point in the same direction. Men born blind whose sight has been restored are said at first to see everything, as it were, crowding in on their eyes. It is significant, again, that landscapes can be successfully counterfeited on pieces of flat canvas. There seem, then, various reasons for thinking that visual solidity and depth are qualities not of sensa but of perceptual objects.

It is worth while examining Mr. Broad's method of meeting a difficulty which he admits in the case of distance. "A special difficulty with which we must now deal has been felt about ascribing distance to visual sensa. It is argued that distance is essentially a relation between two terms, and that a relation cannot literally be sensed unless both its terms are also sensed. Thus we do not visually sense a given line, unless we visually sense both ends of it. Now we certainly do not visually sense our own retinae, and therefore it is impossible that we should visually sense the distance of visual sensa from them. This is a perfectly sound argument, and to meet it we must draw certain distinctions:

- "(1) The first thing to recognise is that the awareness of visual sensa is primarily an awareness of the distance between two visual sensa, and is not an awareness of the distance of either of them from our own retina. . . . I am aware of a visual field in which different parts have different depths. What I sense as visual distance is the difference of depth between two senses in this field.
- "(2) We must therefore distinguish between visual depth and visual distance. Depth is a sensible quality, not a sensible relation. Visual distance is a sensible relation between two visual sensa, founded upon the difference of their respective depths. . . . If we only sense a single visual sensum (say a luminous flash on a perfectly dark night) we do not sense distance but we do sense depth. . . .

"(3) Sensa are at no distance from our retina, not in the sense that they are at zero distance from it, as the points of contact of two billiard balls are from each other when they hit, but in the sense that the concept of visual distance does not apply at all to anything but pairs of visual sensa." (pp. 297-299.)

This argument is ingenious, but I do not think that it can stand. The position Mr. Broad takes up here is very curious. He states that where we only sense a single visual sensum we do not sense distance. This is a serious admission, for we seem to be as directly aware of distance in the case of a single object as we are of the differences in distance between several objects. These facts would suggest that distance is a quality not of sensa, but of percepts. It is further very difficult to see how, if depth in the case of a single sensum has no implication of distance, such an implication could arise when several sensa are apprehended as parts of a sense-field. What Mr. Broad means by sensible depth is left in some obscurity; but he may be confronted with this dilemma: Depth is either a relational quality, implying in itself the relation of distance, or it is not. If it is, then since we are aware of it when there is only one sensum present, and when the relation can therefore only be that between the sensum and the retina, nothing has been gained by substituting the term depth for distance. But if it is not, then it can only be a unique quality belonging to the sensum itself, like green or red, but unlike them inasmuch as it happens to be possessed by all sensa at a certain distance and no others. Differences in depth would then have no intrinsic thirddimensional character; they would be simply qualitative differences which we learn to interpret in terms of the third dimension. Distance, in this case, would not be sensed, but perceived.

Let me enforce this conclusion by borrowing Mr. Broad's instance of a luminous flash. I am puzzled by a mysterious light which suddenly appears (as I think) on the sea front a hundred yards away. It disappears and returns again, and I recognise it as the revolving light of a distant lighthouse. As I do so, I do not only *judge* it to be farther away; it seems visibly to recede into the distance. Its visible depth, then, is no constant which it possesses as a sensum, but a variable which is determined by its perceptual meaning.

The question of sensible depth is of special importance owing to the part it plays in Mr. Broad's account of the manner in which we come to form the notion of the perceptual object. To this problem we must now turn.

## $\Pi\Pi$

Let us be quite clear as to the nature of the task which Mr. Broad has here set himself. It is not to show how, with sensa as our clues, we come to discover the physical world, for that world is not there for us to discover. What is there is a number of independent sense-fields (visual, tactual, auditory, etc.) connected only by the fact that we sense them at the same time. Not, however, in the same space also, for each sense-field has its own space, or rather is its own space. The problem, then, is to discover how, with such materials as its only data, the mind comes to form the notion of a coherent physical world, of which these data are regarded as only aspects or properties.

There are two distinguishable though closely related questions: how we come to form the notion of our own bodies and how we come to form the notion of other objects. Let us, with Mr. Broad, consider the latter question first.

The following is a brief outline of the process by which

we come to acquire a belief in perceptual objects, as described in the chapter on "Positions and Shapes of Sensa." It is to be borne in mind that, for Mr. Broad, this is equally an account of the nature of those objects; for they exist only in being apprehended: their esse is percipi. An observer senses a visual sensum so in the middle of a field fo. He walks towards it, and, as he does so, senses a series of visual fields  $f_1$  . . . .  $f_n$  in the middle of which are sensa s<sub>1</sub>. . . . s<sub>n</sub> respectively, similar to s but continually increasing in size and diminishing in visual depth. At length he senses tactual sensa correlated in shape with the visual sensa; and hence comes to identify the seen place with the touched place. This place is essentially a place in the movement continuum, i. e. the continuum of the successive positions of the observer's body as he approaches the sense-object. The foregoing statement needs further elucidation, for words like "walking" have been used which imply physical space. Mr. Broad explains that when we walk what we are actually aware of is a series of kinaesthetic and muscular sensations, and that the series is "interpreted as the traversing of a physical line of a certain length by the observer, because the sensible depths of the similar sensa s<sub>1</sub>... s<sub>n</sub> in the middle of the successive fields  $f_1$ . . . .  $f_n$  continually diminish as the series lasts longer." (p. 315.)

There are several features in this account which seem open to objection. I have suggested that to regard our visual experience as we approach an object as a series of different but similar sensa is to misrepresent the facts, asserting discreteness where there is unbroken continuity. But here we see that by this procedure Mr. Broad actually increases his difficulties. Why should a decrease in the depths of *similar* sensa be interpreted as the traversing of a physical line? Before such an in-

terpretation can have even a prima facie plausibility, the unity which has been taken away from the sense-object has to be restored to it "in a Pickwickian sense." But even when this has been done, we may still ask why a decrease in the sensible depth of the one sense-object should be interpreted as the traversing of a physical line. I have attempted to show that the difficulties raised by visual distance are not solved by the introduction of the notion of sensible depth. If "depth" is to serve any useful purpose, it can be shown to be more than merely "sensible." The argument, therefore, in so far as it depends on awareness of sensible depth, is accounting for the perceptual world in terms which presuppose it.

The same objection obviously applies to another feature in the account. The movement-continuum, we are told, is the continuum of possible positions of the observer's body. That body, of course, is itself a perceptual object. Before we can form a notion of other objects, therefore, we must have some idea of our own bodies. We have now to ask what light the sensum theory can throw on the process of forming the notion of our own bodies.

Mr. Broad's treatment of this subject (in the chapter on "Sensible and Physical Motion") is pervaded by the idea of correlation. This term, as we have seen, plays a part in the account of the process by which we come to acquire the notion of objects other than the human body. But in the case of our own bodies correlation is a far more constant and important factor. "With other objects that appear in my visual sense-history I have to initiate a certain series of translatory kinaesthetic sensations before I can sense any correlated tactual sensa." (pp. 438-9.) Not so in the case of the observer's

own body. Not only is correlation here a much more general feature of experience, but also even where it fails it is often helped out by suggestion. "Only a very small part of these tactual sensa will be correlated with his visual sensa. But I can start with a visual appearance of my hand visibly in contact with a visual appearance of some part of my trunk, and can gradually move my hand so that its successive appearances in successive fields are nearer and nearer to the extreme edge of the appearance of my trunk. At length I shall no longer be able to see my hand; but the characteristic sensa will still be sensed, and they will be continuous with those earlier ones which were correlated with the visual appearance of my hand visibly in contact with the visual appearance of part of my trunk." (pp. 440-1.)

It will be seen from these passages how important is the part assigned to correlation in the process of forming the idea of the human body. But what is correlation? What is meant, for instance, by saving that a tactual sensum is correlated with a visual sensum? It seems clear that, as time is the only connecting link between tactual and visual sensa, all that ought to be meant is that we sense the two sensa at the same time. It does not seem possible, however, that mere connection in time could yield the detailed correspondences that we need; nor does Mr. Broad suggest that it could. Correlation for him means more than connection in time. But what else can it mean? It seems to me that any answer to this question must break down the selfcontainedness of the sensum and the mutual exclusiveness attributed to the sensa of the different senses. The sensum theory asserts that our sense-data, to be rightly understood, should be taken at their face value; it denies that they convey information about anything other than themselves. What I wish to urge is that the introduction of the idea of correlation is inconsistent with the view of the function of sense-data which the theory maintains, and implies the view which the theory rejects.

Correlation, for Mr. Broad, is not merely connection in time, but means essentially correspondence in shape, or spatial form. If this conception is to be of service, both visual and tactual sensa must literally possess shape in the same sense. It would not avail, of course, to say that shape is literally visual and is only applied to tactual sensa in a Pickwickian sense; for it is not until correlations have been made that Pickwickian senses arise. Whether they are "numerically" identical or not, therefore, tactual space and visual space have an identical nature, in spite of the fact that they are apprehended by modes of sensing so different as seeing and touching. This fact is open to two interpretations. Either spatial form is immediately sensed, or else, though not itself sensed, it is something about which our senses yield us information. The second alternative clearly strikes directly at the foundations of the theory, but the first is not less fatal to it. For it cuts the ground from under the assumption that the object of one sense is ipso facto different from the object of another sense; and this is none the less true even if it be still held that visual space is numerically different from tactual space. But when this is recognized, there seems no longer any ground for holding that visual and tactual space are two and not one. For a spatial form which is the same for two such diverse kinds of material as visual and tactual sensa cannot be merely an attribute of, or an abstraction from, these sensa; it must have a certain independence of either. There seems no

reason why a space so conceived could not be occupied by both visual and tactual sensa. And this is just the commonsense view which the theory is seeking to subvert.

It seems, however, inaccurate to speak of shape as being sensed. This is fairly clear in the case of tactual sensa. As Mr. Broad remarks, "passive touch, considered by itself, gives very vague information about shape." (p. 340.) If we learn more from active touch, this is because active touch is not only a tactual experience but an experience of movement. This apprehension of movement, however, as Mr. Broad also tells us, is not in itself a spatial experience, but a series of kinaesthetic and muscular sensations which we learn to interpret as spatial experiences. But this interpretation is itself exhibited as a result of correlation, and the argument thus moves in a circle. On the one hand it is only by correlation that we get beyond sensa; on the other hand we must have got beyond sensa before correlations can be made

Though we get more direct information about the shape of an object from sight, even the visual shape is something more than a sensum. When we say that a penny looks round, has "round" a merely sensible significance? If anyone says yes, will he maintain the same view if for round we substitute elliptical? The more exclusively geometrical associations of the latter word reveal more clearly the fact that shape is not merely a sensible impression but implies at least an elementary form of measurement; the apprehension of certain relations between the different points on a figure. Shape, in a word, is an object not merely of sense but of the understanding.

The attempt to exhibit the formation of the idea of

a physical world as a result of correlations of shape between independent objects of the different senses thus seems to me to break down at all points. Yet it is obvious that we can and do compare and correlate the evidence about shape given by the different senses. The explanation is to be found in recognizing that seeing is always more than sensing visual sensa and touching always more than sensing tactual sensa.

It is perhaps worth noting that Mr. Broad's account of the way in which we come to form the notion of physical objects is only made plausible by the abstractly intellectual way in which he treats the acquisition of knowledge. If there is originally a conative element in experience, it seems to follow that from the outset we must be in conscious relation to a world of perceptual objects, however vaguely that world may at first be apprehended. One does not see how a conative attitude could exist towards sensa. From this point of view also the process of correlation appears to presuppose the apprehension in principle of the physical world and to have as its function the development and differentiation of this knowledge.

The view of the role played by mind in experience which emerges from the foregoing discussion is very different from the view taken by Mr. Broad. For him, though he does not put it quite so bluntly, the work of the mind consists in constructing elaborate fictions. But if the criticisms offered in the present article are well grounded, the mind in making correlations is not manufacturing fictitious objects but discovering real ones: whilst its activity is already seen in the materials with which it works; they are not supplied to it, ready made, from outside.

It is at this point that I find it specially difficult to

understand Mr. Broad's position. Knowledge, we are told, is developed from sensation, which is a complex consisting of acts of sensing directed on sensa. From such a starting point we might expect that it would be maintained that experience consists of a succession of sensations and nothing more, and that an attempt would be made to analyse mental processes into a succession of acts of sensing. This would seem to me to be the logical development of the position, but it would clearly be a suicidal course for Mr. Broad to take. For a succession of acts of sensing can only yield a succession of sensa; and an activity other than sensing must therefore be introduced in order to account for our belief in a physical world which is more than a number of sensa. But unless this activity is somehow present in even the most primitive form of experience, it is difficult to see how it ever comes into experience at all. However this may be, it is clear that the process of building up our imagined physical world out of sensedata cannot begin until there is something more on the subjective side of experience than acts of sensing. And when this "something more" is present on the subjective side, there seems no logical ground for speaking of the objective correlate of this mental complex as a sensum, i.e. as the object of an act of sensing. To put the point in another way: if the sensum is merely the object of an act of sensing, how can the transforming mental activity become aware of it at all; and how are we to conceive the relation between this activity and the original act of sensing? The only way out of these perplexities, as it seems to me, is to recognise that more than sensing is involved in the so-called "act of sensing." That this is so is strongly suggested by the use of the word "act" in this connection. For the nearer

my state of mind approaches to a sensational level, the less can I find in it anything that can intelligibly be called an act. Mr. Broad's consistent use of the expression "act of sensing" seems to me significant, therefore, as indicating in his primitive form of experience the presence of an unacknowledged element. And if the act of sensing is to be rejected, then, I submit, the sensum must be rejected too.

There remain many interesting aspects of the theory which I have not discussed: for example, the further problems that arise when the perceptual world is considered not merely as my world but as a world that is common to us all. But as this paper is already too long, I shall not attempt to deal with these questions, but shall conclude with two quite general observations. The first is that only a very slight change in the theory would be needed in order to transform it into a one-sided idealism. For the theory holds that what we regard as our real world—the world that we believe ourselves to inhabit and which contains everything that we value and strive for—this world, at any rate, is the product of our mental activity. And even the sensa of which this world is actually composed have a very doubtful claim to independent existence. Mr. Broad tells us that sensa are either selected or generated or both. If selection were eliminated—and it is admitted that there are grave difficulties in holding that they are selected—the sensum theory would end in a thoroughgoing subjective ideal-For in the last resort it must be the mind that generates sensa; the body is itself only a collection of sensa.

The other point—an obvious one—I will put in the form of a question. How would Mr. Broad account for the fact that mutually independent classes of sensa—

visual, tactual, auditory, and so on—exhibit such close correspondences with one another that we can build up the notion of a physical world from them? Would he be content to say that the fact is so, and that we have simply to accept it? This surely would not be philosophy, but the abdication of philosophy. The existence of such striking uniformities offers as genuine a problem to the reason as the difficulties which led Mr. Broad to form his theory, and no less insistently challenges him to seek for an explanation. It cannot be supposed that Mr. Broad is unaware of or indifferent to this challenge.

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## THE APPEARANCE OF VALUES

THE term "appearance" in the title of this article may be interpreted in two senses. It may mean the appearance to us of values, or it may mean simply the appearance in itself, the *happening*, of values. I wish in what follows to discuss both these meanings. I propose to explore briefly certain problems of our experience of the thing which we call "value," with a view to discovering whether "value" can be defined in terms of the experience of it, or whether it must be thought to possess objective and independent existence, or whether it may in some sense be said to be a product of a subject-object relationship. The first position tends to lead to subjectivism, the second seems satisfactory up to a point, but beyond that presents grave difficulties, whilst the third (which I shall defend) is apt—when it is clearly visualised at all—to be credited with the faults of both and the virtues of neither. I shall begin by discussing views of the relation of values to knowledge.

The ordinary commonplace unreflective attitude to values is to regard them as qualities of objects, as belonging to objects in very much the same way as colour and shape belong to them. Commonsense has no theories about the matter, but it would, I suppose, take it as an accepted fact that the values which it distinguishes at all (and it is of course constantly experiencing value without being aware

that it is value) belong to the things which yield them. Without making fine distinctions between instrumental values and intrinsic values, unreflective commonsense conceives the value to be *in* the treasury notes or the land or the iron ore, as the beauty is *in* the picture. Certainly with regard to the tangible things which commonsense for the most part discerns as most clearly valuable, there is no idea at all that the value may be due to the presence of knowing mind. We know the values as we know the things, they are *there* in the things, ready to be known.

The smallest amount of reflection, however, will induce commonsense to halt and perhaps to recant its first naïve assumptions. There seems to be a difference between a thing's value or worth and its colour or shape. Money in a napkin hidden in a field is not of real, but only of potential value. Its value becomes real only in use, in relation to the needs of human beings. So of the land or the iron ore. And beauty in its turn would seem to have little real value "in the desert air." It seems important, on second thoughts. that we enjoy beauty; the perfect gramophone playing the Fifth Symphony in the uninhabitated wilderness seems to lack something (if we can think of it apart from ourselves surreptitiously listening in). And with this conviction borne in convincingly and suddenly upon commonsense, it may perhaps spring to the opposite extreme and argue that beauty is "in the mind," or, less correctly, "in the eye" or "ear." Or, with the aid of a little philosophic jargon. commonsense may learn to distinguish between the primary and secondary qualities, and values; and it may call values "tertiary qualities" taking the term tertiary to mean two removes away from reality, or, in other terms, purely mental.

But the more subjective position must not be assumed

<sup>&</sup>lt;sup>1</sup> I take the terms here as identical in meaning.

without question to be necessarily more "philosophic" than the view which takes values as entirely mind-independent. Dr. G. E. Moore in a well-known passage in his Principia Ethica<sup>2</sup> argues staunchly that values are entirely mind-independent. He says "Let us imagine one world exceedingly beautiful. Imagine it as beautiful as you can; put into it whatever on this earth you most desire—mountains, rivers, the sea, trees, sunsets, stars and moon. Imagine these all combined in the most exquisite proportions, so that no one thing jars against another, but each contributes to increase the beauty of the whole. And then imagine the ugliest world you can possibly conceive. Imagine it simply one heap of filth, containing everything that is most disgusting to us, for whatever reason, and the whole, as far as may be. without one redeeming feature. Such a pair of worlds we are entitled to compare. . . . The only thing we are not entitled to imagine is that any human being ever has, or ever, by any possibility, can live in either, can ever see and enjoy the beauty of the one or hate the foulness of the other. . . . Well, even so, supposing them quite apart from any possible contemplation of human beings; still, is it irrational to hold that it is better that the beautiful world should exist. than the one which is ugly? Would it not be well, in any case, to do what we could to produce it rather than the other? Certainly I cannot help thinking that it would." Again, discussing the arguments of Socrates in the Philebus. Moore says, "If we are really going to maintain that pleasure alone is good as an end, we must maintain that it is good, whether we are conscious of it or not. We must declare it reasonable to take as our ideal (an unattainable ideal it may be) that we should be as happy as possible, even on condition that we never know and never can know that we are happy. . . ."

<sup>&</sup>lt;sup>2</sup> Principia Ethica, pp. 83-4.

<sup>&</sup>lt;sup>8</sup> Ibid., p. 89.

I have quoted Moore's words in full because they express very clearly the point of view that values can exist apart altogether from minds. It is a view difficult to accept. As regards the actual argument of the former of the two cases, it has been pointed out before now that Moore begs the question by introducing his own consciousness into the matter. He says, to begin with, that we must not imagine that any human being ever has enjoyed or can enjoy the beauty of one world and hate the foulness of the other, and then he goes on to say that he himself would hold that the beautiful world ought to exist rather than the ugly. If, on the other hand, we take the content of the argument, we shall find it hard to conceive that beauty should be in the least valuable (apart altogether from the question whether it could even exist) without human minds to appreciate it. And so again of pleasure. We may agree that the pleasure which no one ever knew, that is, pleasure entirely apart from a conscious being, could not be the good or the ideal, but this is just because it could not be a value at all. It is no doubt not impossible that something valuable should happen without any mind being aware of it. But in order to be valuable it would have to be related to consciousness somehow, if only indirectly and ultimately. The processes of digestion which go on within our organisms are highly valuable, and, paradoxically enough, we do not normally realise how valuable they are until they begin to refuse to function. We are not, in health, conscious of digesting food. Yet the value which good digestion possesses is only of value in relation to a conscious living being and its higher functions. Again, a man may quite well be morally good without being aware that he is good. But the value of his goodness could not, so far as I can see, conceivably exist out of all relation to the functioning of his mind. Putting it quite generally, there seem in this connection to be two sorts of values, one sort of which (e. g. pleasure and perhaps beauty) cannot exist without someone's being to some degree aware of them, just because the facts (e. g. the very existence of pleasure and perhaps of beauty) imply the facts being experienced. The other sort (e. g. good digestion or good actions) may exist without direct consciousness or cognition of value just because the facts (good digestion or good actions) may exist without our being directly conscious of them. Nevertheless, whether known or not—and certainly most of the values of the greatest importance for human life do for the most part involve a high degree of consciousness—values are inconceivable out of all relation to mind in one or another of its aspects.

Our general view, then, so far, is that values are not objective in the sense of existing entirely out of relation to minds. But it is important to urge that this denial of the complete objectivity of value does not commit us to accepting subjectivism. If I say that it is good that I should speak the truth I do not mean that the goodness of truthspeaking is something which exists merely in my mind: nor do I mean that the goodness of truth-speaking arises merely through my cognising. When I say that truth-speaking is good, my judgment is objective in the sense that it claims to be a discovery of an objective state of affairs beyond my conscious cognition. In making the judgment I claim that the judgment is objective, and I am prepared to prove its truth in the only way that proof is possible, i. e., by showing it to be coherent with the body of knowledge. Truth-speaking is good because to speak the truth fits in best with the system of the purposes of human existence. So far as its relation to my cognising is concerned, the truth of the proposition "truth-speaking (by me or anyone else) is good" is as independent of my consciousness as is the truth of the proposition about the three angles of a triangle being together equal to two right angles. On the other hand, the avoidance of subjectivism does not imply the acceptance of what has already been rejected, i. e., the complete objectivity of values. To say that the value of truth-speaking is independent of cognition, is as independent of cognition as the fact that the three angles of a triangle are together equal to two right angles, is not to say that it is as independent of mind. It is at least arguable, and it is usually held, that the fact of the three angles of a triangle being together equal to two right angles exists apart from mind. But it is inconceivable that truth-speaking should be good absolutely apart from the existence of any minds who should express themselves in that way, and who should reap the benefit of truth-speaking. When I predicate that truth-speaking is independently good. I mean merely that good truth-speaking is in its being independent of cognition (though apprehended by it). Apart from this, values seem to be constituted—or at least partially conditioned—by minds and relationships between them. Objective conditions entirely apart from minds (e. g. natural conditions) may be the material, so to speak, out of which values are made, but apart from the active life of mind in relation to that material it is scarcely possible to conceive of them existing. The question how mind conditions value is one which we must discuss. For the moment let us examine briefly two other possible rel tionships which the apprehending mind might have to the object of value apprehended. We have seen that it is not ourely qua known that value is dependent upon mind for it being. May it not be dependent qua desired or qua felt

Let us first bre ly examine the view that the value which we apprehend is constituted by some relation to desire. This view has been widely held in the history of philosophy; it is typical of G eek thought. Its best-known protagonist in recent times as perhaps Ehrenfels. Ehrenfels defines

<sup>&</sup>lt;sup>4</sup> In his System der Werttheorie.

value as desirability, meaning by desirability not that which we ought to desire, but that which we actually do desire. The value of a thing is in proportion to the strength with which we desire it. The criticism of such a view which naturally arises is obvious and has been often stated. If desirability meant "worthy of being desired" the objections might fall, for in that case desire itself would not be the criterion, but worthiness to be desired, which is another matter. But if the meaning of the doctrine is that it is actual desire which determines worth, it is certainly not true. We desire things which we recognise to be unworthy. Worth of course might be defined as what the ideal man would desire, but this once more raises the conception of ideality, which is irreducible to terms of desire. The same arguments apply to the included notion that the value of an object is in proportion to the strength of desire. Experience shows that the more we desire an object, the more our conscience may tell us that it is unworthy.

The doctrine that value is a function of feeling, again, and that it is in proportion to the strength of feeling (also a familiar contention in the history of philosophy and held in his youth by Meinong<sup>5</sup>) can be dealt with in much the same way. Feeling may be, indeed it is, a very important factor in the full mature apprehension of value, but it is obvious that my actual feeling in relation to a thing does not determine its worth: a fortiori, the strength or intensity of my feeling does not determine the degree of worth.

Professor Urban, in criticising these wo views, points out first that thought of worth may exict without the existence of desire. E. g., "When I think of an absent friend, I may feel his worth to me without the slightest trace of actual desire for his immediate presence, although the presupposition of that feeling is a disposition so to desire."

<sup>&</sup>lt;sup>5</sup> In his Psychologische-ethische Untersuchungen zur Wertheorie.

<sup>&</sup>lt;sup>6</sup> Valuation, its Nature and Laws, p. 36.

Again, he thinks' that desire cannot be coextensive with valuation because there are fleeting desires which do not attain to the level of valuation,—perhaps a disputable point. On the other hand, desire is not, for Urban, coextensive with feeling, although he thinks feeling more important than desire. "There can be no sense of worth without a meaning which may properly be described as felt meaning, while there can very well be a sense of worth without that qualification which we describe as desire and volition—e. g. aesthetic and mystical states of repose where actual desire is in abeyance. More specifically, even in those experiences which we call explicit desire or volition, the essence of the desire can be equally well described in terms of feeling without doing violence to our speech. The essence of desire is the feeling of lack or want. We 'feel' the 'need' of something."8 Urban's summary of the situation may be quoted with advantage:—"(1) Feeling of positive worth may exist side by side with unpleasant experiences and feeling of negative worth with pleasant. (2) Degree of worth feeling may increase with decrease of hedonic intensity, and there are numerous instances where worth feelings are practically intensity-less." Again there may be feeling of value with irrelevant hedonic accompaniments. There is for example in anger the feeling of negative worth which may be accompanied by pleasure: this pleasure however does not belong to the anger as such but to the organic disturbance pleasantly toned. Once again there are "the so-called intensity-less attitudes or acts of valuation and preference. . . . A quiet sense of obligation may reveal a degree of worth of an ideal object which the intensest passion or emotion does not suggest." And so on.

<sup>7</sup> Ibid., p. 39.

<sup>&</sup>lt;sup>8</sup> Ibid., p. 38.

<sup>&</sup>lt;sup>9</sup> Ibid., p. 74.

<sup>10</sup> Ibid., p. 75.

This is Urban's view. Whilst agreeing with it as far as it goes, I should like to consider further very briefly the place which feeling plays in making judgments of value. Thereafter, having discussed *valuation* and defended value's independence of valuation, we may go on to say a little about the genesis of *value*. For the moment, what part does feeling play in value-judgment?

Let us take the example of a moral judgment. Suppose I say that generosity has moral worth or value. In doing so I am offering a judgment upon an objective state of affairs which is (as we have argued) entirely beyond my present consciousness, although no doubt in judging and in approving of generosity the object becomes related to my consciousness. In this judgment of value two elements of consciousness, cognition and feeling, are prominent; conation or striving or desire is not so prominent and may be left out of consideration for the moment. In judging that generosity has worth, I am cognising generosity and predicating value of it. There is also present, I think we may say, feeling, at any rate in the original judgment of value. It is true that I may make the proposition "generosity is good" without much, if any, feeling. I may make it because I have heard someone else say so, or because I myself have come by now as a matter of course to regard it as having worth. But if I make the judgment, having direct, fresh, living acquaintance with generosity as an intrinsic value, then I make it feelingly. If I am to probe into the meaning of generosity as an intrinsic, actually realised value (and not merely as instrumental to some other end) I have to feel its value. There is always the disposition, as Urban says, to feel.

Feeling indeed plays a most important part in the genesis of the original moral judgment. Suppose that by peculiar circumstances I have never before been acquainted with gen-

erosity and then I am suddenly confronted with some overwhelmingly generous act. The most striking characteristic of my experience is that I feel its value (cognition of course is implied necessarily in every conscious experience), and it is my feeling which leads me to make the spontaneous judgment "how good" or "how fine." Note the phrase "feeling may lead me" to make the judgment: the judgment of value is not simply a feeling, but it is initiated by a feeling. Now however there enter the factors of intellect and reasoning. The original moral judgment "how fine" arises because of feeling, but its validity is not proved by feeling alone. It is one of the most familiar facts of experience that persons of moral immaturity pronounce things to be fine which riper moral insight would pronounce to be otherwise. Feeling in itself is not a certain criterion of validity. It must be supplemented by analytic reason and its canons, and in moral questions it is systematic moral philosophy which supplements intuitive insight and helps us to say with greater certainty what is of true value and what is of false. The moral man making an original judgment of value upon generosity pronounces it to be good because he seems to experience and "feel" the internal intrinsic "harmony" of generosity. His feeling possesses a pleasant tone, yet is more than merely pleasant, having a concrete that character all its own which we call "moral." The moral philosopher, on the other hand, supplements, corrects, and modifies his intuitive judgments by examining their relationships with the wider system of moral purposes in the world.

But even here the process is not complete. It returns to feeling. The moral sage *may* have thought and reasoned about moral questions for a lifetime, but he does not, if he

<sup>&</sup>lt;sup>11</sup> The view that feeling has a concrete character involves considerations into which I cannot enter here. See my "Towards Realistic Psychology," *Journal of Philosophy*, XXI, No. 18, and "Knowledge and Feeling," *Psyche*, V, No. 2.

is the true sage, stop there. He knows by experienced intuition the good, and not only this particular good or that, but the Good of Life. And, being wise, he is able to judge as much by his feelings of satisfaction as by his reasonings, and perhaps better so. Reasons and proofs are valuable and essential, but they may lead us astray, and intuitive wisdom which is the fruit of much reasoning may on occasions be better. So, in the end, feeling may be the test. It is the feeling of satisfaction, not in this or that thing, and not in an individual life only, but in a well-functioning life lived according to the best purposes of society and the wider cosmos. The feeling which comes with wisdom is often the best criterion of value which we possess, telling the enquirer whether the value is fleeting, insubstantial or selfdestructive, or permanent and profound, coherent with the whole system of life's true purposes.

As regards feeling, then, though a thing has not moral value because it gives us a certain feeling, nevertheless the cause of our first immediate judgment that it has moral value is the fact that it gives us a certain feeling. There is not involved here the false proposition "this is good because it gives me a certain feeling," but only that the experiencing of feeling of a certain kind is in psychological fact immediately followed, in the case of the original moral judgment, by the judgment of value. This judgment must in turn be followed by critical intellectual analysis and synthesis, but this in its turn may be profitably complemented by the wiser feelings of the moral sage.

To sum up what has been said hitherto. We have argued that value is independent, as regards its existence, of the cognitive processes involved in its apprehension, and of our desires and feelings with regard to it, though desires and feelings (and particularly the latter) may be prominently involved. The mistake of Ehrenfels and Meinong seems to

be that they confuse the processes and accompaniments of our *valuation* with the constituents of the object of *value*. Urban corrects their mistakes by pointing out that values may vary independently of our mental processes, and thus disproves any point to point dependence. Values are, in fact, wholly independent of our valuations.

And yet, as we have said generally, values are not wholly independent of mind. What kind of relation, then, do they

have to mind?

The relationship which values have (as regards their genesis) to mind must be a relationship of the whole mind, and it must be one which is entirely distinct from the process of valuation or valuing. It must be an activity of the whole mind because there is never in psychology any definite evidence that anything less than the whole mind is involved. We do not know simply, or feel simply or act simply, but knowing and feeling and acting are always involved together. So that although one or another of these aspects may be stressed in the process of mind which we are about to discuss, the differentia of the process cannot be the exclusive presence of one or another of these aspects. As we cannot for example say that valuation is merely a process of cognition (exclusive of other factors) so neither can we say that the process of mind which determines the existence of value is, say, merely a process of activity (exclusive of other factors). And if this is true, if the apprehension of values cannot be put down (e. g.) to pure abstract cognition and the determination of their existence to pure abstract activity, then it is all the more necessary that the two distinct psychological moments of the whole mind should be discovered, one conditioning the existence of value and the other knowing it. I do not suggest that in psychological fact these distinct processes are always separate or separable. But as the nature of value does seem to compel us to suppose that mind plays a part in conditioning the existence of values, and as it is not the mind as *valuing* which does this, we are led to make the hypothesis of a distinct process in all cases.

This complete mental activity of which we are in search is one in which, though it implies cognition and feeling, the life of action seems to play the most prominent part. Very roughly and very broadly we may say that it is through the active developing life of mind (and body) 12 working out its destiny and salvation in contact with an obstinate world of hard fact, that values come into existence. Values arise through the meeting of life, mind and spirit with 'dead' nature. In our mind by itself—if mind by itself is conceivable—there are no values. In dead nature 18 by itself there are no values. Mind does not make the values out of its own stuff and project them on to reality, as has sometimes been thought. It is only through the active objective life of discovery, trial and error, experiment, expression, creation, that values begin to appear. Values are like the sparks which fly out when flint strikes steel, or the flame which appears when we strike the match upon the matchbox. The spark or the flame is not there beforehand either in the agent or in the object; it comes into existence through an active process on the part of the agent on the object. If we keep the useful analogy before us we shall not be inclined to say that mind creates value, if by creation is meant a process which produces out of nothing, nor on the other hand shall we be inclined to say that mind (in the process with which we are now concerned) discovers value ready

<sup>&</sup>lt;sup>12</sup> These must be taken together always. In the genesis of some values the body is of special importance. For the sake of avoiding pedantry I shall not add the 'and body' each time.

<sup>&</sup>lt;sup>18</sup> Or what, for all practical purposes, *seems* dead nature. I use the term in order to exclude animal life, for there is no reason to suppose that animals do not realize value. They certainly behave as if they do. But here we are concerned only with human values.

made in the non-mental mind-independent world. Rather may we say that values are struck. It is of course true, on the other hand, that mind does make values by its willed activity, by the changes in the world which it initiates and without which values could not exist. It lies with us whether particular values shall or shall not be; it is we, not nature, who have the initiative. In a sense we do create values, but (as was said) out of a material which we do not make. We do not create out of nothing, and if creation meant this—as it need not—the term would have to be avoided. We create in the sense that by our agency we bring to existence value which was not there before. The sculptor, the painter, the musician and the poet all do bring into existence by their willed activity new values. And again, although so far as the process of mind which we are now discussing (i. e. the process of conditioning) is concerned, we do not discover, there is another process of mind in which we do, i. e., the process of valuation. The process of generation cannot, in itself, be a discovery, but we may discover in, through, and after, generating. Mind in one aspect conditions and even creates value (though always out of its active contact with an independent world) and in another aspect it discovers what it conditions or creates.

This general conception might be worked out and applied to the different values, but I do not propose to do this at any length here. The value of beauty seems to be generated somewhat as follows. In apprehending the beautiful object (say a work of art) we are apprehending an independent object and the beauty seems at first sight to reside in the object. Yet much more than this is involved. Through a complicated process of association which, in

Arist. Soc., 1925-6, No. 2. See also Hind, April, 1926.

<sup>&</sup>lt;sup>15</sup> Note that beauty is not a value, but a valuable thing, a thing possessing value. Values are always adjectives of concrete things or processes.

proper aesthetic perception, becomes merged and fused into the present experience, the parts of the beautiful thing come to possess a symbolic significance. We do not think of them as meaning something other than themselves, as pointing away from themselves, but they are, unconsciously or subconsciously, charged with rich meaning which comes from the whole history of human experience. The shapes and colours and sounds and their symbolic meanings are however not a mere isolated heap of entities. They are formed in a work of art, into a unity, and this unity is the special characteristic of the art object. Through the aesthetic object human experience is focussed into a unity and perfection which at ordinary levels it does not possess. In looking at the aesthetic object we are experiencing value, in the first place through the present flavouring of experience by association with previous value-experiences, and in the second place, through the integration (and at the same time radical modification and selection) of these into a perfect wholeness and a new meaning. It is through an active process of mind-and-body that beauty becomes generated, but it is a process of which in aesthetic contemplation itself we are not conscious. Once given the product (i. e. beauty) of the mind active in this way, we may be truly said to discover it. The mind by an active synthetic process of experience (always working in closest touch with a world which is distinct from it) conditions and even creates beauty. Given the created beauty it then knows it and values it, and this process is distinct from the process of its genesis.

The sphere of the moral life yields perhaps the most fruitful illustrations of the way in which value becomes generated through the active life of endeavor which is lived in a hard and obstinate world, where adaptation is necessary to fit us not only for physical but for moral survival. Moral values are not discovered ready-made, to be

enjoyed and manipulated by a mind which has no part in their genesis. Moral values have gradually been developed in the hard struggle for adaptation and mastery of the environment. The environment is both natural and social. The virtues, e. g. those of courage, temperance, perseverance, were developed out of the sheer necessity to adapt in order to survive. Lack of them would have meant extinction. But having been generated in this way, they were discovered to be noble and worthy in and for themselves, to have a dignity of their own. "Social" virtues such as loyalty, self-sacrifice, justice, similarly arose out of necessity, and similarly were discovered to reveal the quality which we call moral value. Through the very shutting perforce of his eyes to what seemed most dear to him, his own ease, his own pleasure, his own life (the values of which in turn arose out of his natural active life in reaction to his environment), through lowering his head, so to speak, and plunging out through the arctic blizzards of existence, man has discovered to his delight, queerly, the worth of it all. It is the truth to which all the moral paradoxes have testified. To gain happiness, forget it and seek objective interests; to save your life or your soul, throw it away and lose it; to become rich, throw away your riches. Moral values arise through active moral virtues and moral virtues are always in the first instance a denial of what seems immediately good. Otherwise "ought" would have no meaning. At the lower stages of morality the necessity which forces itself upon the individual, comes, as we have said, of the natural and social demands necessary for survival. At the higher stages the same thing may happen (as when men have found their souls in acts of selfsacrifice such as occurred in the late War) or new values may arise through the moral beckoning of values which are known, but only very vaguely and dimly so, through a

kind of intuition born of previous discoveries of values in analogous ways. We know from experience that it is worth while to devote ourselves to a noble and worthy cause even although the cause may make at the moment but little appeal. And we know what are likely to be noble causes from our general moral experiences of noble causes in the past. We may not realise fully here and now the nobility of the cause, but moral experience commands us to generate a real value by going ahead and acting, if necessary without much inspiration. The value may be made simply by going and doing what needs to be done because it ought to be done. Morality need not begin in sentiment and its values arise through plunging directly into the life of action.

The same, generally speaking, is true of the values of knowledge, of artistic endeavour, and of the commoner instrumental values which we call the "good things" of life. We seek knowledge because it is necessary in the first place, and it is necessary not because it gives us pleasure but because we must have it in order to survive. And if in civilised life the finding of truth does give us pleasure and becomes a value in itself, it is only found to be so after a long process of hard and often very weary seeking. Short cuts to pleasure via knowledge are unsatisfying except to the shallowminded. The true scientist and the true philosopher have perforce to forget the pleasurable value of truth-seeking for the greater part of their lives, and only at rare moments is the delight of discovery enjoyed for its own sake. So, again, the artist no doubt gets joy out of his creation, but his making is a labour: there is pain and dissatisfaction and irritation, and it can never be argued with success that there is more pleasure than pain in it, and that it is done primarily from any motive but a more or less blind urge from within. The artist struggles and

battles with his dead material and out of his struggles the value of beauty emerges. So again of the lesser values of life. The discovery of the value of exercise arises from exercising. The experience of the values of food, drink, recreation, amusement, all arise out of active animal and human functioning. Value is not originally sought as the end, and value for the greater part is not known or realised until it is made and generated through action. I need not stop to repeat again that the processes, though distinct, are not always separate. The acting which generates is not the discovery, but we may discover through acting. Sometimes the generative action is unconscious or subconscious, as it seems to be in the case of beauty, sometimes it is more or less conscious, as with morality. But however this be, mind conditions what it discovers, and, without the action of mind, that which it discovers (namely values) could not be. What is before mind in time is the independent world, and through the interaction with this world value comes into being.

This seems to give us some hint of the solution of the problem of the relation between value and existence. The question is one which has received some discussion. We may begin by agreeing with Professor Sorley<sup>16</sup> that when we make a judgment of value it is always predicated on the assumption or under the hypothesis of existence. And we may go on to quote Professor Urban, who distinguishes between three cognitive attitudes towards reality, first, presumption, second, assumption, third, judgment. By presumption he means, we may suppose, the implicit taking for granted of reality which is similar to what Bosanquet calls "the continuous affirmation of waking consciousness." It is the most primitive attitude, that of the child which takes

<sup>16</sup> Moral Values and the Idea of God, p. 83

<sup>17</sup> Essentials of Logic, p. 33 sqq.

things for granted without knowing it. Of assumption, Urban says, "Assumption, as a cognitive attitude, has two meanings. According to its first meaning it is an acceptance, a taking as existing, of an object when there is an underlying sense of the possibility of its being non-existent. In this sense it is a half-way stage between the primitive presumption of reality and the existential judgment. . . . In its second meaning it is not prejudgmental but postjudgmental, that is, a permanent assumption is created by habitual judgment; it presupposes dispositions created by acts of judgment and is derived from the judgment attitude. In this case the assumption approaches closely to the presumption, and for this attitude the two terms are often used interchangeably."18 Accepting these useful distinctions we may agree with Urban that value-judgment always presupposes either presumption or assumption, or else is an existential judgment of reality. When we say that justice is good we do not mean that the mere concept justice is good, but that justice assumed as existing is good. Always there is the hypothesis of reality.

But our question is, How is value related to existence and reality? We have seen that, when we make a value-judgment, the subject of the judgment is supposed to exist and is not a mere concept, but what we now have to ask afresh is whether the ground of a thing's worth is its existence. And it may be assumed from the foregoing, that our answer must be in the negative. Professor Sorley argues very strongly in the same sense: he urges that, although in order to have value the thing must exist, the ground of its value must lie in something else than its existence. He says, "If a reason can be found for saying that a thing is good, then this reason must lie in some quality or relation

<sup>&</sup>lt;sup>18</sup> Valuation, p. 48.

<sup>19</sup> Moral Values and the Idea of God, pp. 85-86.

of the thing; it cannot be due to its mere existence, for otherwise the distinction between good and evil would disappear." This, we must agree, is true, and we may add once again that the nature of value is that it resides not in existence as such, but arises out of the active relation of minds to existing things.

A question of terminology then arises, and it has rather more than mere verbal importance. If value does not reside in existence, or in existing things in themselves, where does it reside? The answer seems to be, *primarily* in the relation between active minds and things, and *ultimately* in reality. In ultimate philosophy it seems best to use the wider, richer, and more inclusive term "reality" as the subject of values. The active, knowing, feeling mind, and existing objects, and the interaction between them, and its value, all fall within reality. Reality contains and yields values. It is through the structure of reality that values are possible at all.

And, it may be added, just as the subjective criterion of the importance and reality of values is the knowledge of, and the feeling of satisfaction in, external and internal coherence, so, objectively, are values significant to the extent to which they reveal, through the activity of minds. the profoundest and fullest and widest significance of the Real. Value is not identical (as is sometimes argued) with coherence and system and harmony. To say that it is, is to give too abstract an account and to do less than justice to the living finite minds which make its actual realisation possible. Values are adjectives, not simply of the Real, but of real finite relationships between minds and their environment. Partaking of the flesh and blood and spirit of these real active objective experiences, they are themselves real, as real as anything could be. They are concrete terms, and not mere relations, as such abstract words as "coherence" applied to them would suggest. But they are terms in relation, and their full significance can never be judged apart from their relation to a whole life, and in the end, to a whole Reality.

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## THE RELIGIOUS RELEVANCY OF RECENT REALISM

THE religionist of the past was repeatedly alarmed because the special sciences, the children of philosophy, were beginning to leave their maternal home. He feared that the philosophical mother, with her offspring departed for the land of science, would not long be able to maintain the old homestead. The religionist of the present has cause for still graver concern. For to-day philosophy herself is following her children into the territory of facts. The sole remaining member in the ancient household is mystical and metaphysical grandma, who idly sits in her arm-chair, contemplating the past and darning up the gaps in the garments of her grandchildren. Once in a while there is a family reunion, but, with the exception of the aged grandmother to whom the event is a real affair, all concerned regard the gathering as a frolic, significant as a past-time, but totally irrelevant to the serious business of life.

The standpoint in contemporary thought which makes the religionist solicitous that recent philosophy is abandoning the way of her ancestors is new realism. New realism repudiates with vigor all that smacks of the metaphysical or *a priori*. To the new realist, there is only one way of knowing, whether the objective to be known is matter or mind, fact or value. The way is scientific analysis. Realistic theory stands for "the substitution of piecemeal, detailed and verifiable results for large, untested generalities recommended only by certain appeals to the imagination."

To the realistic thinker, all the perennial controversies of philosophy have occurred because philosophers have sought metaphysical universality instead of mathematical simplicity. The traditional philosophies are indicative that, historically, thinkers have been more influenced by the dictates of temperament than by the desire for truth. Philosophical success will only be possible, believes the exponent of new realism, when philosophers cease to regard esthetic contemplation, mystical intuition and moralistic aspiration as legitimate methods of understanding reality. The philosopher must interpret the world as it actually is, and not as he, in speculation, would like it to be.

The new realist whole-heartedly accepts both of the fundamental tenets of current scientific theory, namely, empiricism and evolutionism. The two other main philosophies of to-day are less radical. Idealism endorses empiricism, especially as the standpoint refers to the data of the social and historical sciences, but evolutionism is hardly vindicated in idealistic doctrine. Pragmatism, on the other hand, espouses ardently the idea of evolution, but the pragmatist places too much confidence in creative hypothesis as a way to truth to be enthusiastically empirical. The new realist believes that his mathematical logic, with its justification of independence in epistemology and emergence in cosmology, permits him to be empiricist and evolutionist both, in his reaction to reality.

This interpretation of philosophical inquiry is, of course, quite different from that of the religionist. For, to the

<sup>&</sup>lt;sup>1</sup> Bertrand Russell, Scientific Method in Philosophy, p. 14.

devotee of religion, romanticism is necessary for insight into the fundamental nature of the real. Emotional appreciation, no less than empirical analysis, is requisite for a thorough acquaintance with the truth of the world. There are two kinds of rejoinders which the religious interpreter of reality can make to the realistic standpoint. In the first place, he may criticize the foundations of the new realist's procedure. He may examine the validity of the mathematical and pluralistic logic upon which the new realist's confidence in scientific analysis is grounded. In the second place, he may inspect realistic philosophy to see whether or not the new realist himself avoids the speculative tendencies he finds so deplorable in theories of the past. The present paper is a discussion of this second type of reaction. The writer would show that the new realist, his polemic against sentiment notwithstanding, is vitally concerned with interests dear to the metaphysician. Our desire is not to show the inadequacy of a purely scientific theory, so much as it is an intention to demonstrate the ubiquity of religious notions in philosophical thought. Old axiological grandma may not be out in the world of physical activity, but her influence is felt there just the same.

New realism, we believe, in spite of its professed empiricism and evolutionism, manifests a speculative bias in its theories of knowledge and nature. We shall indicate first how realistic epistemology betrays in its exponents the motives of mystical metaphysics.

The epistemological theory of new realism is called neutral monism. Experience is regarded as a single phenomenon, possessing the neutrality of being interpretable from the standpoint of either matter or mind. In stuff, experience is neither physical nor mental. Its character as material or psychical depends, not upon its inherent nature, but upon the relations which it bears to other entities of the universe. If it is considered as independent of the knowing agent, as in physics, we have the interpretation of experience traditionally regarded in terms of matter. If experience is considered in its connection to a knowing being, as in psychology, we have the new realist's explanation of the reality historically called mind. Fundamentally, the substance of one is the same as that of the other, for both, ultimately, are logical, or mathematical, in nature. The name, double aspect theory, is sometimes given to this interpretation of experience.

The nature of neutral monism may be indicated further by defining the two concepts which may be regarded as constituent notions of the theory, namely, independence and immanence. The former represents the thesis that objects of knowledge depend not at all for their being upon being known. The idea of independence is significant of the new realist's denial of the validity of the egocentric predicament. All the new realists are exponents of independence in the case of sense-perception, but the concept does not receive universal support when it is applied to memory images, illusions, volitions and values.

The second constituent concept of new realism, immanence, refers to the notion that when an object is perceived the object itself, and not an idea of it, enters into the perceptional relationship. Since, according to this doctrine, the object known and the content of knowledge are one and the same, the conception is often called the identity theory. All the new realists are in accord with regard to the notion that objects themselves, and not copies of them, are directly perceived, but there is disagreement with respect to the status of consciousness itself. The English new realists are willing to reduce the content of mind to identity with the object, but are insistent that this despoiling of

mind as content should not be considered as destructive of mind as activity. G. E. Moore holds that, however objective the content of mind may be, its functional aspect is subjective and psychical. This mental phase of experience he designates awareness.1 In the phenomenon, enjoyment, S. Alexander finds a factor in experience that is peculiarly private and personal.2 Moore admits, however, that the conscious element of awareness is empty and diaphanous, and Alexander is never unequivocally positive that psychosis is not a form of neurosis. The American new realists have an even more radically objectivistic point of view. All of them eliminate mind as either act or content in perception, and some of them treat consciousness as a mere relation in complex knowledge situations. E. B. Holt and R. B. Perry both regard any content, which one mind may have, as open to observation by other minds, and both treat the activity of mind as the movement of a physiological organism. In the theories of Bertrand Russell of England and of E. G. Spaulding of America an attempt is made to find a place for both the introspectionistic and behavioristic standpoints. Both of these new realists vigorously deny, however, that the psychical is, in any sense, constitutive of the physical.

It must be readily acknowledged that the epistemology of new realism is the most scientific theory of knowledge which has yet appeared in philosophy. It does represent a serious effort to examine mind with the same empirical methods which have historically been used in the investigation of matter. Nevertheless, the doctrine contains features reminiscent of traditional speculative procedure. Let us notice some of the respects in which realistic epistemology is more suggestive of mysticism than of mathematics.

<sup>1</sup> Mind, N. S., XII, p. 449 and ff.

<sup>&</sup>lt;sup>2</sup> Space, Time and Deity, Vol. II, pp. 11, 12.

In the first place, the new realist, like the traditionalist, treats logic as the goal, rather than the guide of philosophy. Like the formalists and intellectualists of the past, he makes life conform to logic, instead of treating logic as an interpretation of life. Traditionally, philosophers have been wont to disregard contradictions and change in order to erect philosophies conformable to the logical ideal of a perfect universal. The new realist is prone to neglect consistency and continuity in his zeal for a logic which exalts pluralistic simples. The motive of the new realist, like that of the traditionalist, is the desire to explain the given actualities of the world in terms of some speculative and conceptual norm. The aim is certainly not one with which a religious philosopher could find much fault.

The new realist's solution of the ego-centric predicament is an instance in which an abstract form is considered more authoritative than an actual fact. The new realists, in their joy at being able to analyze in situ the act and content aspects of mind, forget that in actu there may be no discreteness in consciousness. If empirical evidence is to be trusted, it seems probable that, in reality, experience is a unity. The bifurcation of consciousness into two features, in order to show the independence of one from the other, is a methodological device. To make it indicative of an actual state of affairs is to grant pluralistic logic a legislative and constitutive function, which, according to a scientific interpretation of logical theory, it has no right The mathematical realist of the present, like to possess. the metaphysical realist of the past, divides, in his epistemology, what for common sense is one, and then hypostatizes the distinctions made.

When new realism is carried to its logical conclusion it must declare error to be as non-mental as an entity of physics. Some of the new realists guarantee this objectivity to error by placing it in the realm of subsistence, where as a purely logical being it cannot be regarded as the product of mind or matter. This procedure deprives error of either psychological or physiological subjectivity, but unfortunately it places error in a realm where it cannot be eradicated. Error becomes a feature of ultimate reality, and the new realist, despite his polemics against absolutism as a philosophy postulating necessary falsity, becomes himself a defender of error as inevitable. Making error ontological is, in motive, not unlike the traditional religionist's practice of giving evil cosmical import. To W. H. Sheldon, the new realist, in consigning error to the class of subsistents, is guilty of the fallacy of the faculty psychologist who is often able to interpret only by invoking the occult thing called Reason. In the opinion of A. O. Lovejoy the attempt to explain hallucinations objectively by employing the notion of subsistents is "primitive spiritism."2

In endorsing the behavioristic theory of human conduct, the new realist favors a doctrine with metaphysical implications. The metaphysical character of behaviorism is disclosed in the behaviorist's conception of the psychological stimulus. The stimulus of reaction in behavioristic psychology is not the limited determining factor it is in physiology. For the behaviorist, the stimulus includes, besides biological features, all the past conditions in an individual's personal and social history. More fundamental still, to the behaviorist, are the physical implications of the stimulus. In the last analysis, according to behavioristic psychology, the cause and director of human activity is the realm of nature itself. In accepting, as he

<sup>&</sup>lt;sup>1</sup> The Strife of Systems and Productive Duality, p. 203.

<sup>&</sup>lt;sup>2</sup> The Journal of Philosophy, VIII, p. 598.

does, the general validity of the conservation of energy theory, the behaviorist must hold that every electron-proton change in any particular aggregate redistributes the strains in the universe as a whole. In other words, he is obliged to maintain, as we have tried to show in another connection, that everything in the world makes a difference to everything else, a principle precious to mystical philosophers and to all who, contrary to the pluralistic procedure of science, would explain the part by the whole.

The new realist analyzes further than the behaviorist, to be sure, and the realm of subsistents, rather than the level of electrons and protons, is his ultimate sphere. The motive of the realistic thinker, however, is the same as that of the behaviorist. In interpreting mind as an adaptation to the environment, or as a portion of the environment selected by the nervous system, or as an entity generated from basic logical elements, the new realist, no less than the behaviorist, strikingly exhibits what Bertrand Russell disparagingly calls "the system-maker's vanity."

Not only in his interpretation of the stimulating situation, but also in his conception of the reacting agent the new realist has a theory significant of metaphysical interest. The new realist, like the philosophical religionist, would show that the responding self is, in some sense at least, free. In other words, the new realist does believe that in personality there is a factor that cannot be entirely reduced to physiological or physical terms.

S. Alexander develops the idea of freedom in his notion of enjoyed determination. For Alexander, "Freedom does not mean ignorance of the real causes of action. On the contrary it means awareness of them. . . . Freedom of the will always involves purpose, but purpose, though essential to willing, is not essential to its freedom,

<sup>&</sup>lt;sup>1</sup> The Journal of Religion, IV, p. 349 and ff.

that is, it does not define its freedom. . . . Freedom in general is the experience which each thing has of its own nature." We contemplate the levels of existence below us, that is, we observe them to be interpretable completely in terms of objective science, but we enjoy the realm which we ourselves represent, that is, we are aware of a novel subjective sphere not accessible to scientific investigation. According to Alexander, freedom is not the prerogative of man alone. It is the privilege of any level in the evolution of reality with respect to the stages below it. This conception of freedom will not satisfy the man who wants the self to be a creative and controlling force in the on-going of the universe. It will please one, however, to whom freedom simply means uniqueness and novelty.

E. G. Spaulding finds grounds for the belief in the freedom of the self in the logical principle that a whole is more than the sum of its parts. Unique reality is vouchsafed for selfhood by the principle that, although the constituent parts of personality may come and go, the organization representative of personality remains. In its relationship to its physical, biological and psychological components personality is a new and transcendent quality. As an entity over and above its material and mechanical constituents it has laws to itself alone.1 Spaulding's theory of human freedom is an aspect of his cosmical doctrine of creative synthesis, which depicts reality as evolving by increasingly richer levels each of which is free from the specific exactions of the other levels. In Spaulding's conception, however, as in Alexander's, the freedom of man is more apparent than real. For even though, in the theory of Spaulding, the entities of the psychological human level are productive of the esthetic, ethical and theo-

<sup>&</sup>lt;sup>1</sup> Space, Time and Deity, Vol. II, pp. 331-333.

<sup>&</sup>lt;sup>1</sup> The New Rationalism, p. 449.

logical realities higher than man, man, after all, must be considered as determined by the physiological and physical factors below and before him. The religionist will approve the realistic contention that the human realm is different from the sub-human, but he will not assent to the implication of the new realist's position that the determinants of the human are to be found exclusively in levels less qualitied than the human.

R. B. Perry and E. B. Holt find freedom in selfhood in the fact that different individuals have different biological interests. Volitions of various men are different because their physical organisms are not alike. Man has purposes, and if he fulfills his purposes he is free. This interpretation will satisfy the demand of the religious thinker that the self be proficient in practical activity. It will not satisfy the religious requirement, however, that the self be effective in theoretical behavior. Because, according to Perry and Holt, the purposes, which impel personality, are not the result of creative reflection, but of mechanical, biological inheritance.

So much for the metaphysical notions which arise in the new realist's consideration of the object and subject of knowledge. Let us now notice his theory of nature to show that, as ontologist and cosmologist, the new realist presents conceptions in which a religionist might find much to favor.

According to his platform, the new realist has only contempt for the concepts of substance and cause. Their presence in theories of nature are significant, thinks the new realist, of thought-destroying sentiment. The new realist, however, lives in the same world as the traditional philosopher, and no amount of disdain for these concepts can free him from facing the problems which they have historically represented. The problem of substance em-

braces the ontological question regarding the permanent in reality, and the problem of cause comprises the cosmological question regarding the evolution of reality.

In spite of his hostility to the concept of substance, the new realist is manifestly an ontologist. His passion to reach the ultimates of reality and his zeal to learn whether the ultimate is one or many betray his intense ontological interest. The new realist's theory of ontology is expressed in his doctrine of neutral entities. As we have already intimated in discussing realistic epistemology, ultimate reality, as revealed by analysis, consists of simples that are in themselves neither matter nor mind. The only property which neutral entities possess is the one which even analysis cannot reduce, namely, being, pure being, or is-ness. Not in psychology, nor even in physics, but in logic, mathematical logic, is the true interpretation of reality to be found. The fundamental realm of being is a pluralistic sphere of externally related terms and relations. The new realist, however, is singularistic enough in his logic to grant that propositions may also be considered basic. At least, the proposition that there are terms and relations is regarded as legitimately ultimate.

To consider everything in reality to have logical foundation is a point of view with which the religiously minded thinker may have a great deal of sympathy. It means that the objectives of faith and hope are fundamentally as valid as the interests of sense and reflection. As W. H. Sheldon remarks, the search for logical ultimates reveals the "tenderminded," semi-religious desire for peace, rest and security. Helen Huss Parkhurst also points out that the postulation of unitary, integral, essential wholes is indicative of a compelling force which is one of feeling rather than reason. "The notion of a universe of closed, self-

<sup>&</sup>lt;sup>1</sup> The Strife of Systems and Productive Duality, p. 224.

contained, autonomous entities, impervious to change and destruction, such as the realist provides for himself, is," in the judgment of Miss Parkhurst, "one of the emotionally most comforting notions that is producible by metaphysics." That at least some new realists assume a mystical attitude towards ontological neutral entities is manifest in the contention of G. E. Moore that the essence of value is its simple and indefinable quality, and in the opinion of Bertrand Russell that "to abandon the struggle for private happiness, to expel all eagerness of temporary desire, to burn with passion for eternal things" is "the free man's worship."

Because of his conviction that the being of values lies in their subsistential status, the new realist denies legitimacy to the axiological conceptions of both present idealistic and pragmatic philosophers. He denounces the idealist's principle that values must be valued by the cosmos to be valuable to man, and he decries the pragmatist's proposition that values must be valued by man to be valuable to the cosmos. With the exception of S. Alexander and R. B. Perry, who allow human interest some constitutive power in the field of axiology, the new realists give universal scope to their solution of the ego-centric predicament, and declare that values, as well as cognitions, are not the product of personal or psychological forces. This point of view will satisfy the religionist who can be content to know simply that values are. It is too formalistic, however, to please a religious philosopher who would also like to know what values are.

In other words, it is not enough, from the standpoint of religion, for logical entities, especially if they are values, to be simply independent and intrinsic. They must

<sup>&</sup>lt;sup>1</sup> Recent Logical Realism, p. 42.

<sup>&</sup>lt;sup>2</sup> See Principia Ethica, Sections 5-22, and Ethics, Chapter VII.

<sup>&</sup>lt;sup>3</sup> Mysticism and Logic, p. 55.

be immanent and influential as well. A philosophy which would interpret the actual world must account for the progressive as well as the permanent character of reality. Metaphysics must embrace cosmological as well as ontological considerations. The new realist accepts the challenge of metaphysics to be cosmological, but does so, we believe, by presenting notions which his analytical logic

hardly justify.

To explain evolution the new realist endows his logical ultimates with a positive and prolific character which analysis never reveals as present. S. Alexander grants motion to the supposedly quality-less Space-Time; E. B. Holt ascribes generative power to his unqualitied neutral stuff; and E. G. Spaulding permits some of his subsistential elements to possess relating capacity. It is amazing how the new realist can at one time ridicule the metaphysical notion of causality, and at another time present a cosmological theory of emergent evolution in which the higher levels of being, as concrete life, mind and deity, are declared to be the derivatives of simple, mathematical concepts. The ultimates of new realism are too abstract and thin to constitute a rich and full reality without interpreting them equivocally as possessed of causal potentiality, which, according to the new realist's anti-causational logic, they should not contain. The new realists are in a dilemma in their cosmological theory. Either the Space-Time of Alexander, the organizing relations of Spaulding and the generating propositions of Holt are completely analyzable or they are not. If they are reducible to mere being, then emergence is miraculous and the new realist's contention that intellectualistic logic can explain evolution is invalidated; if they represent features irreducible, new realism as a doctrine of reform, as a theory to demonstrate the complete efficiency of analysis, is not vindicated. The new realists are either mechanists and their theory is naturalism with a different title, or they are teleologists in the sense of accounting for novelties by a vital principle and are, therefore, idealists in all but name.

The religious implication of the cosmological theory of emergence is disclosed in the new realist's enthusiastic acceptance of the axiological concept of progress. In every way and on every day the world of the new realist, like the patient of Coué, grows better. For S. Alexander, E. G. Spaulding and E. B. Holt especially, the cosmos is a development towards perfection, and perfection is an infinite limit always ahead of the nisus. In the terminology of Alexander, the world is "an eternal straining after deity." With the exception of Bertrand Russell, who suggests that ultimately reality is a "universe of ruins," all the new realists who present cosmological theories at all take the position that values enter somehow or other into things to guarantee a world that will increasingly become beautiful, good and true.

This optimism of the new realist is not a standpoint significant of impersonalistic science. The notion is one which, from the point of view of facts, cannot be proved. It is doubtful even whether the concept is applicable to the world as a whole. Bernard Bosanquet asserts that universal progress "might be disputed from a modern standpoint on the sole and unique ground that there can be no system of reference from which it can be judged, no intellectual as no physical ποῦ στῶ." A. Seth Pringle-Pattison also maintains "that progress is predicable only of the part which can interact with other parts, and, in such interaction, has the nature of the whole to draw upon. It is unintelligible as applied to the whole, and the temporal view of things cannot therefore be ultimate."2 When

<sup>&</sup>lt;sup>1</sup> The Meeting of Extremes in Contemporary Philosophy, p. 194. <sup>2</sup> The Idea of God in the Light of Recent Philosophy, p. 383.

one's attention is called to the fact that there is no empirical evidence for the new realist's notion of infinite progress, one cannot refrain from surmising that the realistic philosopher, like his optimisitic friend, the idealist, is not immune from religious speculation.

In conclusion, we would express the hope that our discussion has not suggested that new realism is a futile philosophy. Its superiority to mystical theory in dealing with the factual and material is readily granted. We acknowledge, after Bergson, that abstract and logical intellectualism, which new realism represents, is the standpoint supreme for comprehending the sphere of mechanism. Our only interest has been to indicate that, to arrive at a doctrine which is truly realistic, intuitive aspiration, as well as inductive analysis, must have a place. For life, after all, is larger than logic, and universals that are conceptual cannot fully portray a universe that is concrete.

We have no quarrel with philosophy, the mother of the sciences, for leaving the house of her fathers for the realm of empirical endeavor, but we trust that she will always remember that, "Be it ever so humble, there is no place like home."

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### MATHEMATICAL REALITY

THE mathematician often meets the question: What do you mean when you say that there are imaginary circular points at infinity, or when you talk about a space of four or even more dimensions, or many other similar notions used in mathematics? In what sense is there any reality to these things? Are they not mere ideas that you are able to invent but which after all one cannot meet in the real world? You discuss curved Einstein spaces but when you walk the streets with the rest of us you behave just as we behave. What is the meaning of the phrase: existence of Einstein space?

The question is a fair one, and the mathematician should meet it candidly. Some do not, but on the contrary endeavor to evade it completely by admitting that the most of mathematics is purely postulational, built, for instance, on the idea of the integer, and that these four-dimensional worlds are merely convenient phrasings of the problems of four variables, and that no idea of extent should be attached to them. We are supposed by such apologists to be dealing with the Philosophy of the "IF—THEN." Others attempt a half-hearted explanation in terms of psychology and physiology, by asserting that we are so constructed that we are not capable of appreciating directly the existence of these

imaginary worlds, any more than we can receive directly sensations from the radio waves.

But these are shallow answers and do not go to the bottom of the question. We discover by some clear thinking -as recommended by Descartes-that we have many mathematical ideas that are not expressible in terms of integers alone. We discover that the objects of thought which are unique, perfectly definite, and as precise in any sense as the idea of integer, are very numerous. We do mathematical thinking about these objects, these ideal constructions, and it is in no sense dependent upon the thinking about or with integers. We discover further that most of what we think we have derived through sense-data, is an elaboration upon sense-data, by processes which are not in the sensedata. Just as when we look at a moving picture what we actually see is a succession of stationary views interspersed with a succession of dark views, but what we make out of this by our own activity is a continuous picture of moving persons and objects, a synthetic whole, which is really very different from the physical facts. So with all sense-experience when it passes through the facile fingers of the mind. It is wonderfully transformed into a synthetic whole, even as a musician transforms a series of sounds into a marvelous symphony. And the "IF-THEN" philosophy does not cover mathematical results very well, for most of them belong to the "AND-THEN" philosophy. For a careful scrutiny of the so-called hypothetical reasoning in mathematics will lead one to see that the postulates are for the most part definitions of that about which we expect to say something. We actually create a mathematical entity and then proceed to describe it and its properties in much the same way that a chemist synthetises a new compound and then finds out what he can about it.

We come back then to the question: What is Mathemat-

ical Reality? The question implies at once that we have some idea of what reality is to mean, otherwise the question itself needs some explanation before-hand. In case we mean by reality, material reality, the reality in electrons and energy and the like, then we must say at once that mathematical objects have no such reality. If we mean by reality that of a state of the ether traveling with the velocity of light, or such a reality as temperature, or entropy, or other similar things, we will admit that mathematical objects do not possess this sort of reality. They cannot be measured by any instrument, when they do not possess any such reality as that of the physicist. They belong to the intangible, invisible, inaudible, supra-sensual world.

"Ah!" the scientist says, "I see now where you are leading us. Into the limbo of Mysticism we must go, and find our way by the will-o-the-wisp." But do not be frightened, friend, Mysticism is your daily companion, though you know it not, and her will-o-the-wisp has led you past phlogiston, caloric, action at a distance, the ether, gravitation, and many other forgotten swamps. Mysticism merely means the more intense inspection of what is to be seen directly, immediately, what lies so close to us it is part of our being. Mysticism furnishes direct knowledge, not knowledge which is the result of a chain of reasoning, every link of the chain being subject to the question: forged you, and out of what metal, and what is your tensile strength? And Mysticism is present all the time with the mathematician. Most of his statements "This is because that other is so" are actually statements which mean "When I perceive this construction, I remember that in it is this other construction." Take almost any "proof" and examine it closely and you will find that it actually consists in pointing out features of the object under investigation in such a way, and in such an order that they become visible

to the other person. As Poincaré pointed out long ago, logic has no compelling power in itself. It is merely a systematic statement of what we see directly, or at least remember we have seen directly. It is evident then that we are most of the time examining a non-material, intangible, invisible world, whenever we are thinking. What is the origin of this world, whence it came, and how, is another story. We wish here merely to exhibit it.

In this world are the objects of mathematics, whether they be numbers, lines and points, functions, operators, forms, invariants, propositions, or doctrines. They have that reality which inheres in the world of ideas. Since ideas affect matter, and since ideas have a power of effecting great changes in the phenomena of the earthly existence, we see that they are just as existent as electrons, entropy, ether, energy, or, we dare say it, entelechy. Many men have died because of ideas who would never have fired a shot for an electron. It was an idea of Maxwell which made the radio possible, not the waves (if there be any) in the ether (if there be an ether). Ideas persist as effectually as chemicals, and more effectually than animal forms. The idea of happiness is a will-o-the-wisp which still leads mankind through all sorts of events. And the dream of Pythagoras that integers could give the key to the universe is a will-othe-wisp that scientists are following very fast now-a-days. The ideas of mathematics still fall into their places in the magnificent cathedral that has been building these many centuries, while the snows of yester-year vanish never to return.

Reality? Does persistence in time measure reality? Then mathematical objects certainly possess far more reality than pyramids of stone. Success in causing re-arrangements of material things—does that measure reality? Then the long witness of the ages shows mathematics

directing the fleets of the nations, uniting the earth, the sea, and the air, so that the earth is one, not many, in its nations, and its peoples. Does the real consist in what everyone may see for himself, and agree with all others as to what he sees? Then mathematics has the only known reality. Does reality consist in that hidden harmony and beauty which makes the universe with all its diversity hang together, and give evidence of an internal structure which means stability and permanency? Then mathematics is most aware of such harmony and beauty in its ideas and objects. We must not assert that what can be weighed in a balance or turn a galvanometer needle is real and what cannot be so handled is not real. In such case we would be compelled to invent a new term to cover the reality of existence. But is not then a centaur real in this sense? Certainly the ideal centaur is real, the material centaur is not. But equally the ideal cube is real, the material cube is not. There is no such thing as a cube made of electrons or atoms. The mere discontinuity of matter alone would prevent. And even a cube made of continuous ether does not exist. Such an object consists of ether (material) as thought, fused with the mathematical cube (ideal) as thought. In fact so much of our daily life is made up of sense-data, held in a matrix of ideal-data, that we pay little attention to the latter, or if we do, we fall into the silly error of thinking the ideal-data are actually a part of the sense-data. A little reflection soon shows the utter impossibility of the judgement. This awareness of the ideal world is what is rapidly coming back into the scientific consciousness, after some years of submergence.

In fact Mathematics is a creative interpretation of the world: which means this. We have certain descriptive interpretations of the world, of which science (natural science) is one. The object of a descriptive science is to

record what is observed and from such a record to get a systematic and consistent explanation of the phenomena of life. A creative interpretation does not do this. It constructs an ideal system of objects which it studies, and about which it undertakes to know much. Then it undertakes to fit the events of life to this ideal system. One of the best examples is celestial mechanics, which is an attempt to fit the phenomena of the heavens to the system of rational mechanics, at least so far as the ideal law of gravitation will permit. The development of rational mechanics includes many studies into forces of character different from the gravitation considered, with different laws of action. When to this celestial mechanics is added the study of fields with curl, divergence, and the like, we have a much larger ideal system which will to some extent enable us to fit to it the phenomena of electromagnetic fields. That this ideal system is the only one, is not true—as was pointed out long ago by Poincaré and Volterra.

The objects of mathematics are then (as defined sometime since in the Century Dictionary by Charles S. Peirce) ideal structures, and their reality is that of any ideal structure. That this kind of reality is something different from that of the physical world is seen at once in the wide range of ideal structures which do not permit the phenomena of the world to be hung upon them. In mathematical terms, we study many objects and their transformations which do not admit the world of nature as an invariant. But let us not forget that there are many more invariants than those we find examples of in nature. It becomes evident then that the thinking activity of man has ranges which are beyond those of sense-data, which are in other words, supra-sensual. If to study these is Mysticism, then Mysticism is the largest part of our thinking.

And now we hear a skeptic's voice: "Ex nihil, nihil fit." How can a mathematical object be created out of nothing?

And if out of something, what is that something? In reply we ask him how he became acquainted with his "nihil" and what he means by "something." If he means material stuff, whether ether, energy, or electrons, he can easily see his own answer. Who told him that there is no existence in the universe but that of matter and its various manifestations? His own researches disprove that assertion. If his nihil means the ideal, we agree that out of the ideal arises the ideal. He returns however with the new challenge: "When the mathematician passes into his eternal sleep, where do his mathematical objects go?" Here indeed is the crux of the matter. If as Poincaré said: "Tout ce qui n'est pas penseé est le pur néant," then when the thinker ceases to think, the thoughts cease, and we have a real nothingness. When the reel of film is run through and put into the box, the show is over. What is the reply?

We may admit that if the ideal can be destroyed then the ideal object does not exist. So too if matter can be destroyed, (as seems evident just now) then of course matter ceases to exist. Yet we behold in the distant stars the ceaseless creation of matter and we behold in the history of the universe as far as we know it the ceaseless action of thought; and all we can say is, that there seems to be no adequate reason to suppose either that matter will cease to be or that thought will cease to be. If the universe cease to exist, mathematics of course will cease to exist. But whatever reality there is in any of the ideal constructions of mathematics will exist so long as the ideal itself exists. There is no greater guarantee for any other kind of reality.

"Toute action doit avoir un but. Nous devons souffrir, nous devons travailler, nous devons payer notre place au spectacle, mais c'est pour voir; ou tout au moins pour que d'autres voient un jour."

JAMES BYRNIE SHAW.

University of Illinois, July, 1925.

## MATHEMATICS AND NATURAL SCIENCE

THERE are various opinions concerning the position of mathematics in the field of science. The position usually taken is this, that mathematics has direct connections only with the exact sciences, i. e., with those which have reached the quantitative stage. And for these sciences mathematics is, according to some, the indispensable tool without which many of their questions could not be studied; according to others, the exact sciences are the source of the problems to which mathematics owes its existence as a living science. Without entering upon a discussion of these points of view, both of which can boast a venerable age, this paper considers the bearing which the studies in the foundations of mathematics, made during the last thirty or forty years, have upon the relation of mathematics to the sciences. These studies have been held by some to be essentially sterile, not capable of contributing to the extension of the domain of science. While this may be a more or less valid position for one who adopts the points of view referred to above, it must be admitted that it is one of the primary purposes of any intelligent pursuit of scientific knowledge to gain deeper insight into the fundamental bases of the sciences. To contribute to the accomplishment of this purpose has been the aim with which the present paper was written.

The beginning of work in the foundations of mathematics, although suggested by studies pursued during the half century preceding, may be said to have been the work of Peano in the last decade of the nineteenth century. The subject gained a position of central importance as a result of Hilbert's lectures on Euclidean Geometry at the University of Göttingen during 1898-9, published subsequently as Grundlagen der Geometrie. The method used by Hilbert is one, which has become known as the postulational method and of which the fundamental characteristics may be summarized as follows: Realizing that in any deductive science, new concepts are introduced upon the basis of a definition, i. e., a description in terms of concepts already known, and new propositions are accepted on the basis of proof, i. e., a deduction from propositions already proved, the beginning of such a science, if it is to have one, must consist of concepts which are left undefined, and of propositions which are left without proof. Thus the basis on which Hilbert's developments rest consists of a set of undefined elements ("point," "line," "plane," the relations "between," "congruence," etc.) and a set of unproved propositions or postulates stating properties of the undefined elements. These postulates must satisfy certain conditions, of which the most important one is that of consistency. From them consequences are derived without the intervention of any extraneous elements and thus is obtained a body of propositions which constitutes a geometric science. Now the question arises whether this abstract science has any connection with the concrete science of geometry, which finds application in a variety of allied fields and in which we deal with data more or less directly related to reality. The connection is established as follows: Elements of experience are introduced in such a way that the undefined propositions are verified when the undefined terms in them are identified with these new elements. An illustration will

perhaps be in place here. It will be simpler, however, to use for this purpose a different postulate system, viz., one of many given by Professor Huntington. The basis consists of a class C of undefined elements, called a, b, c, etc.; an undefined dyadic operation upon elements of C and denoted by o; and three unproved propositions, viz., (1) If a, b and aob belong to the class C, then boa does and aob belong to the class C, then (aob)oc does and (aob)oc all belong to the class C, then (aob)oc does and (aob)oc and (aob

On this basis a theory is developed containing a number of propositions, which thus far have significance only for the class C whose elements are under discussion. Now it is evident, however, that if for the class C we take the class consisting of the positive and negative integers and zero, and for o the operation of addition, then the postulates are all verified and hence also all the theorems derived from them. The same statement can be made if C consists of all the rational numbers, excluding zero, and o means multiplication. Thus the postulate system may properly be called a "foundation for the theory of integers," and also a "foundation for nonzero rational numbers." (I must leave out of discussion here the important question as to the sufficiency of a set of postulates for a given field of mathematics. It would carry us too far afield and is of less importance for the immediate purpose of this paper. Its significance for the general theory is clearly evident from the illustrations used above.)

Postulate systems of this character have been set up for various parts of mathematics. Apart from the interest which attaches to them on their own account, they are of value inasmuch as they furnish insight into the logical

<sup>&</sup>lt;sup>1</sup> See Transactions of the Am. Math. Soc., vol. 4, 1903, p. 27.

structure of the domains of mathematics to which they apply. The tendency has been to extend their scope, to set up postulate systems which cover a wider and wider range. So, e. g., the General Analysis of E. H. Moore provides a foundation for a number of distinct theories belonging to the domain of analysis.

If we examine these postulate systems more closely, we observe that they are not entirely autonomous. For, if we are to be able to deduce propositions from the postulates, we must utilize logical connections, i. e., we have to draw upon the methods of logical procedure. It is not surprising, therefore, that the need began to be felt of examining more closely what the laws are which govern this "logical reasoning." We are usually asked to be satisfied with the statement that they are processes which are inherent in the human mind and that it is the task of the philosopher or psychologist, rather than of the scientist to be concerned with them. But are mathematicians justified in thus "passing the buck?" Logical reasoning seems, upon close examination, to have as its material, words, spoken or written words, and to deal with them according to fixed rules in very much the same way as mathematics deals with its material. It also, therefore, should be subject to the requirements of a deductive science, i. e., proceed from a basis, consisting of undefined elements and unproved propositions. A good deal of work has been done in this direction by those who have been interested in building up a foundation for all mathematics, including the logic of mathematics. It has given rise to the Formulaire de Mathématiques of Peano, and has reached its high-water mark in the Principia Mathematica of Whitehead and Russell. As an inevitable concomitant of this development there has come into being a system of symbols for the concepts of logic; for it is evident that one cannot rely upon

language as a tool to investigate the logic of language. This approach to logic, which was first conceived by Leibniz and had been pursued to a considerable extent by later writers, De Morgan, Boole, Frege and others, has become known as symbolic logic. Through this work a deeper insight can be gained into the processes which are thought to constitute "logical reasoning," because by means of it the methods of such reasoning are investigated in their interdependence and their connection with the basis which has been laid down.

There is, however, a difficulty; this enters in when we try to turn the results obtained in the symbolic logic to account in the field of actual mathematical reasoning. This should be done, as in the case of the postulates of Huntington, by identifying the undefined elements with definite mathematical concepts in such a way that the postulates shall become valid. But to establish this validity we have in view of the character of mathematics as an abstract science, nothing to appeal to except the "inherent qualities of the human mind," i. e., we are back at our starting point. It is considerations such as these which have led the Dutch mathematician Brouwer to a position, which has been characterized by some as revolutionary, but which may very well be held to be ultraconservative. For he wishes to reserve in mathematics a preponderant influence for intuition and to deny a position of undisputed authority to logic. "In human understanding" he says, "there is no logic; in mathematics it is not certain whether all logic has validity. and it is not certain whether it can be decided, whether or not all logic has validity." This statement has especial reference to the role of the three fundamental canons of logic: the Law of Identity, the Law of Contradiction, and the Law of the Excluded Middle; to the last of which he denies unlimited validity in mathematics.

In concluding this very brief survey of the objectives of the foundations of mathematics, let us observe that there has been a gradual extension of the scope of the foundations, from limited fields to larger ones so as to include ultimately the entire subject including its logical substructure; and that there has come as a partial reaction from this process a suggestion to materially restrict the importance of logic in mathematics.

Now let us turn to the question whether all this work has a bearing upon other sciences and upon their relation to mathematics. In as far as they use mathematics, scientists are usually willing to accept its conclusions and to use them for their own purposes. Looked at from the point of view of the foundations, this amounts to accepting as an established fact that the undefined elements can be so identified with elements in their own domain that the postulates will be satisfied. So, e. g., when the chemist integrates a reaction velocity in order to obtain the quantity of material transformed by the reaction, he assumes that the processes are of such character that the integral actually exists. And usually he is guided in his acceptance of these conditions and guided rightly by his knowledge of the properties of the materials with which he is dealing. How is the situation with regard to the logical bases? Whatever we may think of our brother scientists, it must be conceded that they are concerned as well as the mathematicians with "logical reasoning" and, therefore, that they will be interested in the foundations of logic. In considering these questions, we are driven to consider separately two aspects of scientific work which sometimes seem not to be in complete harmony with each other. In his address at the dedication exercises of the Woods Hole Laboratory on July 3, 1925, Professor Lillie said:

"The scientist devotes his life to increase of learning in

the belief 'that there is no alleviation for the ills of mankind but in the resolute facing of the world as it is,' and with firm faith that by patient seeking the truth concerning man's relations to his world may be found. Through generation after generation of effort always hard and often ill rewarded, there has been produced a great body of scientific fact and hypothesis useful for criticism of creed and custom, for inspiration, for human needs. We are inheritors of this sacred legacy; it is our trust to preserve and develop it." Again, "The function of Science," said Agassiz, is to 'strive to interpret what actually exists."

If we now turn to what is called scientific theory, we encounter a different point of view, viz., one according to which a scientific theory "essentially consists of a conceptual scheme, designed by the synthetic activity of the mind, working with the data of perception, for the purpose of representing particular classes of sequences and regularities in our percepts." The points of view here contrasted are by no means inherently contradictory. Rather are they concerned with different aspects of Science; and the problem is to set them in the proper relation to each other. With this objective in mind, we want to consider the relation between each of them and the work in the foundations of mathematics.

A scientific theory, conceived of as a descriptive scheme, is in reality a mathematical theory, at least mathematical in structure. It must have been some such idea as this which Leonardo de Vinci had in mind when he held that "No investigation can strictly be called scientific, unless it admits of mathematical demonstration." Such a descriptive scheme consists of a set of concepts and a body of prop-

<sup>&</sup>lt;sup>2</sup> See Science, vol. 62, No. 1604, Sept. 25, 1925, p. 272; the italics are mine.

<sup>&</sup>lt;sup>8</sup> See D. S. Jordan, in Science, vol. 62, No. 1606, Oct. 9, 1925, p. 326.

<sup>&</sup>lt;sup>4</sup> E. W. Hobson, The Domain of Natural Science, p. 36.

ositions concerning them which are to be logically connected with each other. What else does this mean but that they are to be deducible from a certain basis by "logical reasoning." But this basis for a science must be such that its undefined concepts are identifiable with the concrete elements of that section of the world as it "actually exists" with which this science is concerned. So, e. g., one would conceive that the foundational basis for genetics would have among its undefined concepts a "hormone" and "gamete," concerning which certain unproved propositions would be laid down. A basis for Chemistry would probably include as an undefined element "ion" or "electron," and perhaps "chemical affinity," etc. But the theoretical scientist has to go further; he has to inquire what "logical reasoning" in his particular field means. And he will have to obtain an answer in terms of logistics, of such a character that the undefined concepts in terms of which his logic is stated can be identified with the categories which have significance in the laboratories of his science. Suppose, for instance, that the concept "negation" were one of the undefined logical elements (as is the case in Whitehead and Russell's system of mathematical logic). If we want to bring the scheme of logic which involves this concept to bear upon "logical reasoning" in a particular science, we must make sure whether the percepts with which the observer in that science is concerned can be "negated" in a manner that has meaning in that field; and if so, it has to be made clear exactly what meaning has to be attributed to the negation. "Base," "acid," "salt" have, or at least used to have, perfectly definite meanings in Chemistry; they are words which correspond to properties that can be objectively verified. What would a not-base, a not-acid be? What objective meaning are these terms to receive if the logical postulates involving the concept "negation" are to be veriwhich would have to be answered before an adequate logical foundation for Chemistry could be constructed. This suggests at once the possibility of a variety of logical systems, each one of them especially adapted to the needs of the observational or experimental aspect of a particular science. Once this were done, we could then determine whether it would be possible to set up a mathematical logic which would provide a second-order abstraction of the different logical systems, just as now mathematics provides an abstract basis for the quantitative aspects of different sciences. And that this would be of importance must become clear as soon as we recognize that the sciences have other aspects besides the quantitative ones and that also on their non-quantitative sides "logical reasoning" is a desideratum.

A postulational basis thus provided for a laboratory science, and that is what the theoretical branch of this science would have to provide, would be sure of consistency as soon as it had applicability. For the very character of the basis would then be such as to assure it of a concrete counterpart; and, in spite of the visitor to the zoo who declared of the giraffe that "there ain't no such animal," the very essence of reality is that it is free of contradiction, in the logical sense. In the field of observational science, what is, is true. It is only in conceptual structures that the logical configuration of contradiction can arise. If, however, our conceptual scheme is constructed, in accordance with the point of view of the foundations of mathematics, so as to be *applicable*, then it is inherently safe from the danger of contradictoriness.

This then is the bearing of the point of view of the foundations of mathematics upon the natural sciences: that their theoretical aspects including the logic adapted to them should be developed upon a postulational basis from the bottom up, in such a way as to be applicable to these sci-

ences as developed in the laboratory and the field. It may be that strange results will come about. We may perhaps find verified the paradoxically sounding dictum of Pascal. "Ni la contradiction n'est marque de fausseté ni l'incontradiction n'est marque de vérité."

It remains to inquire what bearing the conclusions we have reached may have upon the study of the foundations of mathematics. Ouite in contrast with what has just been said about the sciences, the most serious problem in the foundation of mathematics has been that relating to consistency. Our preceding discussion must have made it clear that if for mathematics a basis of ultimate reality could be found, comparable to that which laboratory and field experience furnish to the natural sciences, there would be a possibility of settling the vexatious problems connected with consistency. This would carry with it, however, the necessity of a logical foundation which would be applicable to such a reality. And it is precisely such a basis to which one is led if one follows the point of view of Brouwer referred to above. In the first place he finds an ultimate basis of reality for mathematics in the intuitive concept of time, in which are united indissolubly the concepts of "continuity" and "discreteness" (flow of time or duration, and moment of time or instant), and in which is found the abstract substratum of all observation of change. This, coupled with the capacity of the mind to construct "its own universe, independent of the universe of our experience, somewhat as a free design, under the control of nothing but arbitrary choice, restricted only in so far as it is based upon the fundamental mathematical intuition" constitutes the rock foundation upon which the entire structure of mathematics rests. A postulational treatment of mathematics, if it is to be free from the difficulties inherent

<sup>&</sup>lt;sup>5</sup> See the author's article on "Brouwer's contributions to the foundations of mathematics," *Bulletin, Amer. Math. Soc.*, vol. 30, 1924, p. 31.

in the problem of consistency, must relate itself to these experiential data in the manner of the postulational bases for laboratory sciences suggested in the previous pages, i. e., it must be applicable to these data. And, furthermore, the logic by means of which from such a postulational basis the mathematical superstructure is to be developed must be in harmony with this same substratum of experience. It proves to be rather different from Aristotelian logic which we had become accustomed to accept as derived from the "inherent qualities of the human mind." For, the canons of logic are not found to be endowed with unrestricted validity. It is this which accounts for Brouwer's conclusion that the Law of the Excluded Middle can not be given complete acceptance in mathematics and which has led him to investigate what would result if this law be ejected from the logical basis of mathematical reasoning. It is not inconceivable that other methods may be found by which a basis of reality can be provided for mathematics and that different logical systems will be requisite for them.

The conclusion to which we have come is this: The point of view of the foundations of mathematics, if carried into the field of the natural sciences, suggests a definite orientation of the relations between their theoretical and their experimental aspects. The objective reality possessed by the material with which experimental science deals makes possible a ready disposal of the question of consistency which has been difficult of settlement in the case of mathematics. This in turn points out a possibility of solving the difficulties arising in mathematics by providing a basis of ultimate reality for this science. It is observed that one such solution is furnished by the point of view reached by Brouwer in his studies of the foundations of mathematics.

# INFINITY AND THE INFINITESIMAL (CONCLUDED)

#### PART III

It was Mill's ineluctable contention that the term infinity denoted nothing whatsoever unless associated with a substantive to which the alleged attribute was (verbally, at least) applicable.67 Mill himself, it is true, was several

67 J. S. Mill, An Examination of Sir William Hamilton's Philosophy, 5th edition, 1878, p. 60: "The Infinite itself must be not only infinite in greatness, but also in littleness; its duration is not only infinitely long, but infinitely short; it is not only infinitely awful, but infinitely contemptible; it is the same

mass of contradictions as its companion, the Absolute."

Such words are highly worthy of being pondered. But admiration of Mill, the lustre of whose two major works was sufficient to have illuminated the entire nineteenth century, would be a disservice to the principles he espoused if it blinded us to any blemishes in his arguments. And although, as we have seen, Mill attacked Hamilton's doctrine of the Absolute and, in his System of Logic, signally clarified the canons of that science, he nevertheless himself stumbled over the infinite. Since the ablest philosopher of his day fell headlong into this abyss without a bottom, it is incumbent on us, while availing ourselves of one of his arguments and while paying our respects to his genius, to point to one argument that was faulty, one spot where his genius was clearly peccable. Two brief passages from An Examination of the Philosophy of Sir William Hamilton suffice to show unanswerably that Mill was an advocate of the infinite; and several rejoinders to disputants, appearing as notes in later editions of that opus, show further that he was not to be moved from his position: "The conception of Infinite as that which is greater than any given quantity, is a conception we all possess, sufficient for all human purposes, and as genuine and good a positive conception as one need wish" (p. 62). Again: "The space between two parallels, or between two diverging lines or surfaces, extends to infinity, but it is necessarily less than entire space, being a part of it. Not only is one infinity greater than another, but one infinity may be infinitely greater than another" (p. 552).

Promptly upon the publication of these extraordinary statements—the second being doubly extraordinary in view of what Mill had elaborately said on the significance of spatial conceptions—Dean Mansel entered the lists, urging that the word indefinite was more suitable than the word infinite. To this objection Mill replied, in part, as follows:

"In what Mr. Mansel calls the metaphysical use of the word indefinite, he affirms it to mean 'indefinitely increasable.' Elsewhere he says 'An indefinite time is that which is capable of perpetual addition: an infinite time is one so

times guilty of rash statements regarding the infinite; his customary logical restraint was, as we have shown above, seriously wanting. But his statement that, if we are to speak of infinity at all, we must speak at least of an infinite something, seems closed to any conceivable criticism. And indeed we have not only failed to meet anywhere a reasonable confutation of this particular doctrine: we greatly doubt whether anyone nowadays would be so rash as even to attempt to confute it. It is therefore doubly astonishing that De Morgan, whose mathematical learning was as much vaster than ours as his scorn for an infinite number was more scathing, should have involved himself in this identical blunder. Definitely repudiating the fancy that a number could ever be said to be infinite, and yet lured on by a strong conviction that he had a very definite conception of the infinite,68 he was driven at length into that same blind alley of logic which Mill only a few years earlier had

great as to admit of no addition.' I now ask, which of these is the correct expression for that which is greater than anything finite. . . . Is a merely indefinite time greater than every finite time? Is a merely indefinite space greater than every finite space? Is a merely indefinite power greater than every finite power? The property of being greater than every thing finite belongs, and can belong, only to what is in the strictest sense of the term, both popular and philosophical, Infinite." (5th ed., p. 64; italics ours.)

Our own objection to Mill's argument is twofold: his questions are ille-

gitimate, as his answers, although appropriate thereto, are misleading. He says, Is a merely indefinite space greater than *every* finite space? and answers this question in the negative. However, if we re-phrase the question, as we are bound to do in order to save injecting our conclusion into our premiss, we ask, rather, Is a merely indefinite space greater than any finite space? And our answer to that question is in the affirmative. For what Mill strangely but indisputably overlooked in phrasing his questions as he did was that, by using the word every, he presumed that the number of spaces was a closed aggregate—an illicit assumption that is at the base of all theories of the "completed infinite." On the other hand, as we have said, we have only to ask, Is an indefinite space greater than any finite space? and our answer comes easily, It is so. For, propose any finite space you please, and the indefinite space we reserve conceptually can at once be demonstrated to be larger. Nor can the rebuttal be entered that before your particular finite spaces are appropriated. be entered that, before your particular finite space was announced, this indefi-nite space had not been determined, and that we were waiting for your decision merely to trap you; for had our indefinite space been antecedently determined, it would then no longer have been indefinite; rather would it have been definite as well as finite; and it was our duty to show, not that a definite, but that an indefinite space may be considered larger than any finite space that can be given,

<sup>68</sup> Augustus De Morgan, On Infinity; and on the Sign of Equality, Cambridge Philos. Trans., Vol. XI, pp. 203 seq.

described as a "mass of contradictions" and, after Hamilton, a "fasciculus of negations"—a description, we may add, that is possibly the most temperate, considering the provocation, of all the remonstrances ever breathed forth on the philosophical air of England.

For if we pause to ask what meaning is to be attributed to infinity when that word stands up in naked grandeur, the answer refuses to come; and mere argument refuses to entice it. If there is such a thing as infinity, then some thing, it would seem evident, is infinite. If we are now forced to confess that concerning what this infinite thing is we do not, and perhaps never shall, have knowledge, we have effected an escape through a dialectic trap-door in our platform. And if our desire is simply to escape, anyhow and anywhither, that informal and final exit is advisable. But if our desire is not to evade an argument, but rather to settle a difficulty, our course at once is apparent: we must admit ab initio that our alleged infinity is an infinite something; then we must admit that it is something of which we know, or at least have had experience of in some form, otherwise it must be refused the name "something"; and straightway we have admitted so much as this-and admitting less deprives us of the right to remain longer in the argument—we have arrived at the heart of the controversy. For, having just allowed that infinity is an attribute predicable only of things infinite, we now face the ultimate necessity of explaining what these infinite things are. And this, we submit, can be accomplished in but one way, despite the brightest sophists' having polished their wits for twenty centuries in endeavors to think up another. What is infinite is composed of infinitely numerous parts. These parts, we speciously may affirm, are themselves either finite or infinite. However, since calling them the latter simply defers our analysis of that adjective, we are

driven back at last into confessing that the ultimate constituents of our infinity are, although infinitely great as to number, finite in every other particular. Our conclusions may hence be summarized as follows: Infinity is the name for something infinite; this infinite something, being only another name for a collection of all its parts (which, though finite in themselves, are infinitely numerous), is hence expressible only as a numerical quantity What is only thus expressible must automatically have recourse to numbers; and therefore, we conclude, nothing may be said to be infinite unless a number is first shown to be so.

#### IV

In the last analysis, when all the arguments are in, when it has finally been agreed that a magnitude must be expressible in numerical terms if it is to be credited with the possession of quantity, and when it has been further agreed that the words "infinite number" are a contradiction in language that even a profuse sprinkling of Greek and Hebraic characters is unable either to cover up or to justify—when all this has been granted, however reluctantly, a final question is sometimes sprung by the defendant. And usually, we regret to relate, he appears proud of it.

What of space? he demands in triumph. Nothing can be termed infinite, you have maintained, unless some number itself can be termed infinite. It is true that no number yet found can be termed infinite. It is likewise true that you have submitted several arguments against the expectation of finding such a number. It is true again, or at any rate I am unable at the moment to show its falsity, that without an "infinite number" nothing could be termed numerically, and if not numerically then in no other form, infinite. That is all very interesting. But, I repeat what of space? Somewhere there is a shocking flaw in your argument. You fail to justify your own principles

of logic. By your fine reasoning you have committed yourself to the absurdity of saying what every man in his senses knows is nonsense. Space, on your own findings, is not infinite. Very well: be frank now and say that space is finite. Say so, and I shall have to renounce all those arguments which have led to this preposterous conclusion. Refuse to say so, and I shall then know what I have long suspected—that you are quibbling.

The demand, as thus phrased, we shall first remark, betrays surprising ignorance both of the principles of dialectic and of the manner in which the same question has in the past been repeatedly countered. Yet if the question posed is hypothetical in part, more than one modern realistic philosopher, justly esteemed on many grounds by his contemporaries, has actually challenged the authors with a query nearly identical with the one given. "What of space? If space is not infinite, it follows that space must be finite. But the latter conclusion is a mockery of reason. Space, it hence follows, must be infinite." Such is the purport, almost the verbal facsimile, of the ultimate rejoinder of those who, frustrated by formal arguments against mathematical infinity, make desperate shift to enlist "space" as their ally.

A discussion of realism does not fall within the scope of this paper; nor does the history of philosophic reason. But if the assurance of modern thinkers who propound empty riddles like the foregoing is based on complete forgetfulness of their masters, all their contemporaries can not safely be depended upon to suffer equally from malignant amnesia. The Principle of the Excluded Third or Middle

<sup>69</sup> From a galaxy of thinkers, we select merely one—Alexander Bain whose infrequent mention of infinity, it may be suspected, was due to a belief that the matter was too juvenile for mature study: "The only real notion that we can ever form of extension, as empty space, is a sweep between two resistances: infinite space, where the points, or termini, of resistance are done away with, is therefore an incompetent, irrelevant, impossible conception." Mental and Moral Science, 1872, pp. 48-9.

-the principle here invoked by the infinitists-assuredly is the most generally dependable, as it is the most justly lauded, of all logical devices for setting off two contradictory judgments, and for exposing the antithesis between them. In Aristotle's words, "Everything must be affirmed or denied." S is either P or not P: no middle judgment is allowed by this principle. Either I am a biped, or I am not a biped; either it rained today, or it did not rain today; either there is a word of ten syllables in this article, or there is no such word in this article: these are all valid antitheses. But either the square root of 2 is an odd number, or the square root of 2 is not an odd number (i. e., is an even number)—is this an intelligible use of the disjunction? Clearly it is not, for the square root of 2 is neither odd nor even; indeed, its incommensurability is attested by that very circumstance. We can make such a disjunctive judgment if we like to. We can say, either the square root of 2 is pea-green, or the square root of 2 is not pea-green; as we do not need to instruct our contemporaries, the permutations of English vocables are fairly numerous. But such exercises, it is gratuitous to note, are simply instances of the manner in which thinking men conceivably can, and indeed not seldom do, waste their substance.

Sir William Hamilton was probably the most conspicuous thinker of the last century to countenance such logical malpractice. Armed with this famous instrument of reason—the Principle of the Excluded Third or Middle—he confronted the Deity with the privilege of possessing, and of delivering into his hands as a logician, either some particular attribute or its opposite. Of necessity, his conclusions were abortive. His instrument failed to bring forth a viable answer because it was not applied, and for reasons we deem sufficiently obvious, to an object within the range of experience. As Gomperz trenchantly puts it: "All such audacities come to an end when it is recognized

that the Principle of the Excluded Middle offers us the choice, not between contrary opposites, but simply and solely between a positive statement and the pure negation of it, the latter to contain no jot or tittle of affirmative meaning." In other words, applying this lemma to our problem, before we are justified in imposing the Principle of the Excluded Middle on space, we are required to make some positive statement about space; only then are we logically free to say that, to this positive statement and to the pure negation thereof, no alternative is allowed by our principle. And it is thus that the statement, Space is either finite or infinite, falls into the same class with Sir William Hamilton's disjunctive judgments on Deity.

For (not to enter upon realism in this paper) what positive statement on space can be uttered? Clearly all we can say regarding space is that space is either finite or infinite. And this is not a positive statement about space: it merely is a repetition of our ancient antithesis, not as between a positive statement about space and the pure negation of that positive statement, but simply as between two verbally contradictory attributes attached to another word (space) which itself denotes nothing, and hence might reasonably be assumed to be nothing itself, save as a term correlating certain actual experiences. To say we experience space is simply to say, without any regard for intelligibility, that we experience a mode of experience.

Prejudice is so strong and so widespread, not only in favor of the existence of space as something that actually is experienced, but in favor also of the infinitude of that something, that we feel slight hope of having much weakened or restricted, with these few paragraphs, a dual dogma that is the disgrace of clear reason and the "scanday," as Kant put it, of philosophers.

<sup>70</sup> Theodor Gomperz, Greek Thinkers, trans. by G. G. Berry, 1912, vol. IV, p. 72.

At another time, we hope to make good our present enforced brevity. It must suffice now to terminate this digression by driving home the essential meaninglessness of the question, Is space finite or infinite? The question is meaningless for the sufficient reason that neither of the two answers which it invites can signify anything until an antecedent question is propounded. That question is, Is there such a thing as space? or, in other words, has space sui generis existence? And the answer to this latter question, which must antecede such disjunctive propositions as those noticed, can not be returned in the affirmative unless some one can make affidavit that he has experienced it. This he must do, it is needless to say, without reference to any other object of experience; and this we believe is impossible; to date, in any case, it has proved so. Until such an answer is given, therefore, there is not the least antagonism between our arguments against infinity and the popular feeling that space must be infinite; the only antagonism worth heeding will appear after the disjunctive judgment Either space exists or does not exist is answered in clear language, in terms of direct experience, and in the affirmative. Pending that positive affirmation, the proper course for philosophers would seem to be the renunciation of transcendental puzzles, and the repudiation of illegitimate disjunctive judgments that, as we have briefly shown, refer straight back to an antecedent question.

Moreover, a little further reflection, we believe, will incline those philosophers, at present hostile toward the foregoing conclusion, to a somewhat less mystical attitude. Space will then be treated by them not as a completed vacuum of "infinite" volume: it will be regarded instead as a generality abstracted from different classes of sensations, and applied thereto as a convenient proposition indicating merely the order and intensity of those sensations. The ability to "move" outward indefinitely into space will thus

be the more readily correlated with the ability to "move" at pleasure along the series of natural numbers. And when this correlation is made, the notion of "infinite space" will be viewed, we think, as logically tantamount to the notion of an "infinite number"; the seduction of which notion lies, as was earlier suggested, in just this circumstance—that the unhampered process of writing down numbers ever larger and larger arouses the naive belief that this series is something above and beyond, and independent of, the separate acts of inscribing such numbers.71

71 The existence of space sui generis is a subject better treated in a general examination of realism than in a criticism of the logical arguments for infinity. It might consequently be deemed improper to dwell at any length on, or even to mention at all, a problem confessedly lying afield of our own topic. Nevertheless, it should be noted not only that every defence of space is ultimately plead at the bar of the infinite, but also that the rôles are reversed nearly as often: it is to space that the infinitists turn, nine times out of ten if not more frequently, as the court of last appeals for their client. Without infinity, as indeed most philosophers have conceded, the existence of space is not readily justified; but without space, on the other hand, it is difficult to point to an infinite aggregate. We feel, therefore, that it is competent to us at least to mention, if not here to dwell upon as we might, this particular problem, the more so as Kant's famous antinomy is often alleged wholly to have disappeared, and as the subsequent reification of space is thus held to be perfectly legitimate—whence arises again the phoenix-argument for infinity. For example, J. E. Boodin (A Realistic Universe, 1916, p. 246) says, a pealing to the Cantorian "proofs" of the infinite: "We may regard Kant's thesis, therefore, as obsolete. To quote Bertrand Russell: 'Owing to the labors of the mathematicians, notably Georg Cantor, it has appeared that the impossibility of infinite collections was a mistake. . . . Hence the reasons for regarding space and time as unreal have become inoperative, and one of the great sources of metaphysical constructions is dried up." Mr. C. D. Broad (Perception, Physics, and Reality, 1914, p. 300) similarly echoes the authority of Mr. Russell: "The arguments to prove that space cannot be real because, if it were, contradictory propositions would be true about it, all rest on sheer errors about infinity and continuity. For their refutation we have merely to refer to the relevant chapters in nite aggregate. We feel, therefore, that it is competent to us at least to mention, nuity. For their refutation we have merely to refer to the relevant chapters in Mr. Russell's *Principles of Mathematics*," Again, Sir Thomas Heath (A History of Greek Mathematics, 1921, Vol. I, p. 279) joins in this uncritical chorus of obeisance: "It appears, then, that the first and second [of Zeno's] arguments, in their full significance, were not really met before G. Cantor formulated his new theory of continuity and infaits. On this Lore columns to the continuity and infaits. ments, in their full significance, were not really met before G. Cantor formulated his new theory of continuity and infinity. On this I can only refer to Chapters XLII and XLIII of Mr. Bertrand Russell's Principles of Mathematics, Vol. I." See also Aliotta's Idealistic Reaction against Science, transby A. McCaskill, 1914, p. 335, for an Italian echo of this anti-autinominal jubilation. We select these writers from many, both to show how eager are the infinitists to prove the existence of space, and to justify our own selection of Cantor and Mr. Russell as the chief sources, and admitted to be such, of those arguments for infinity against which we have labored.

It is manifestly no part of our purpose to treat here of elliptical space, i. e., the space of Einsteinian meta-geometry. We are content to rest our argument against "infinite" space—though we have added a few illustrations of it—on the simplest and plainest consequence of pure logic. The reader may be reminded,

If the foregoing psychological argument is valid, and if the notion of "infinite number" has earlier been logically incapacitated, we can now see no escape from the conclusion, already anticipated, that the term infinity is, when strictly used, wholly devoid of significance. Infinite space, infinite time, infinite anything else you may care to affirm infinite, are all concepts reducible to a single form, and meaningless if not reduced to that form. That form is the numerical form.72 For anything which exceeds a single datum of experience implies a repetition or augmentation of that experience—either directly through the senses, or else through a process of ratiocination which itself depends upon memories of other repetitions or augmentations which have occurred and were remarked upon previous occasions. If the original experience is repeated, number is immediately involved; if augmented, a relation is felt to obtain between a present experience and a past, and no otherwise than through numerical ratios can such a relationship be subjected to scientific treatment. Number hence becomes at once the sole language through which we can accurately talk of succession, of repetition, or of increase. And any concept involving what is alleged to be greater or more durable or more intense than any given experiential datum, promptly involves one of these terms, if not all three of them.

however, that our logical conclusion is supported by an appeal to the Principles of Relativity whereby space and "inity" are dirempted. And his attention is likewise drawn to the views of physicists who, on the basis of classical mechanics, have pointed to the absurdities of an "infinite" universe. Arthur Haas, for example, has remarked (The New Physics, N. D., trans. by R. W. Lawson, p. 148) that "the assumption of an infinite universe is incompatible with New ton's law of gravitation." See also Nicolas P. Rashevsky in the Scientific American for Septemner, 1925, and W. Pauli's "Relativitätstheorie" in Encyclopädie der Mathematischen Wissenschaften.

To Cf. Hobbes, Concerning Body, 1656: "Whensoever . . . it is asked . . . How long is the journey? it is not answered indefinitely, length; nor, when it is asked, How big is the field? is it answered indefinitely, superficies; nor, if a man ask, How great is the bulk? indefinitely, solid; but it is answered determinately, the journey is a hundred miles; the field is a hundred acres; the bulk is a hundred cubical feet." Cf. also, Locke, Essay, Bk. II, ch. XVI, sec. 8 and Bk. II, ch. XVII, sec. 13.

We feel some hesitancy in mentioning such matters at all; elaborating on them as we have, and so elevating what may be deemed a platitude to the level of a critical controversy, is perhaps gratuitous zeal, at least in the judgment of such readers as are agreed upon the conclusions here arrived at. But philosophical clarity is cheap, we believe. at the price of repetition, and tautology is at any rate preferable to vagueness. And it is vagueness (vagueness due either to taking certain concepts for granted, or to a study of them so technical that the language used therefor is in constant danger of losing its sobering contact with experience) that debilitates large portions of contemporary logic in its application to mathematical thought. practical use of technical forms of reasoning is to bar out fallacies," as Mill well said, adverting to this particular danger, "but the fallacies which require to be guarded against in ratiocination properly so-called, arise from the incautious use of the common forms of language; and the logician must track the fallacy into that territory, instead of waiting for it on a territory of his own."78 And it is just this ignorance of, or indifference toward, the dangers surrounding the loose constructions of our ordinary speech and writing that causes the major part of the confusion that we have noted. Entering as they do into every verbal study of the subject, such convenient grammatical idioms, provided they are not first rendered harmless by prophylactic measures, contaminate the very principles they are called upon to strengthen and to clarify. On the other hand, symbolic reasoning in its so-called pure form is dangerous in almost direct proportion to its convenience. For these two reasons, therefore, we have chosen the ungrateful task of trying to translate into more fundamental terms a concept that apparently can be portrayed by an abstract mathematical symbol, or by an easily grasped sentence in

<sup>73</sup> J. S. Mill, A System of Logic, 9th edition, p. 113, note.

plain English, but which in either form, without careful psychological analysis, lends itself to the perpetuation, and sometimes to the propagation, of logical error.

Moreover, the psychology not only of the mathematician himself but also of his less talented forebears throws light on the concept we are studying; just as deficiency of oil, by inducing characteristic noises in a machine, calls attention to those parts where there is friction. For this reason, besides observing the lubricated performance of the psyche, we would fain see how it works without the oil of mathematical sophistication. And therefore the study of aboriginal equivalents of "infinite number" is to be recommended as a preparatory course, and a highly sobering one, to the study of an abstruse symbol like Aleph-zero. This study will serve, we think, less to exalt primitive than to abash twentieth-century concepts.

"It is not to be supposed, because a savage tribe has no current words for numbers above three or five or so," E. B. Tylor, 74 for example, has remarked, "that therefore they cannot count beyond this. It appears that they can and do count considerably farther, but it is by falling back on a lower and ruder method of expression—the gesture language." This conclusion has been independently corroborated by a number of animal-observers. Citing a case vouched for by Leroy, Sir John Lubbock relates an interesting attempt to deceive a crow which it was desired to shoot. To allay the bird's suspicions, two gunners went to the watch-house, one of whom passed on while the other remained. The crow apparently counted, however, and kept her distance. The next day three men went out, but again the crow apparently perceived that one of the three hunters remained. Not till as many as five or six men composed the party was the crow, to judge by her actions. numerically confused. Lubbock continues: "Lichtenberg

<sup>74</sup> Primitive Culture, 6th ed., Vol. I, pp. 243-4.

mentions a nightingale which was said to count up to three. Every day he gave it three mealworms, one at a time. When it finished one it returned for another, but after the third it knew that the feast was over. According to my [own] bird nesting . . . experience, if a nest contains four eggs, one may safely be taken; but if two are removed, the bird generally deserts";75 and several even more remarkable instances are given by Lubbock who proceeds to draw the conclusion that many animals possess a slight but still definite ability to count. Commenting on this putative gift, L. L. Conant<sup>76</sup> says: "Many writers do not agree with the conclusions which Lubbock reaches; maintaining that there is, in all such instances, a perception of greater or less quantity rather than any idea of number. But . . . any reasoning which tends to show it is quantity rather than number which the animal perceives, will apply with equal force to the Demara, the Chiquito and the Australian." It is nevertheless true, as Conant himself points out, that deductions from animal behavior are somewhat vague; and therefore, having drawn attention to these facts, we shall now proceed to the firmer ground of human, but still primitive, behavior.

In doing so, it may at once be stated, as a universal law, that "some practical method of enumeration has, in the childhood of every nation or tribe, preceded the formation of numeral words." On Conant's authority it is thus illegitimate to infer, from the poverty of a savage's vocabulary, that his ability to enumerate is proportionally bankrupt. Savages, on excellent authority, are able, and animals (if able to count at all) *must* be able, to count without verbal or mathematical symbols. The collapse of gesture language, however, occurs not long after the exhaustion of symbolic systems. For this reason it is safe as well

<sup>75</sup> Nature, Vol. XXXIII, p. 45. 76 The Number Concept, 1896, pp. 5-6.

as expedient to confine ourselves to actual vocabularies remembering that whilst the spoken sign-system is not a full indication of the savage's mathematical talents, on the whole it is not an unfair one. A short list of numerical terms, collected by numerous inquirers, is hence appended; and a few conclusions will thereafter be drawn from such data:

In the Puri vocabulary we find omi (1), curiri (2), and beyond curiri simply prica, signifying either 3 or many.

In the Tasmanian vocabulary, according to Jorgensen, we find parmery (1), and calabawa (2). Anything greater than 2 is called cardia—i. e., cardia — either 3 or many.

According to A. Oldfield (Transactions Ethnological Society, Vol. III, p. 291) the New Hollanders have no names for numbers beyond 2. The Watchandie oral notation runs as follows: co-ote-on (1), u-tau-ra (2), bool-tha more than 2 or many. If the objects to be indicated are overwhelmingly numerous, the suffix bat is appended to bool-tha; and thus in cases of dire necessity bool-tha becomes bool-tha-bat.

According to F. H. Cushing (American Anthropologist, 1892, p. 289) the Zuni scale is as follows:  $1 = t\ddot{v}pinte = taken$  to start with; 2 = kville = put down together with; 3 = ha'i = the equally dividing finger; 4 = avite = use the fingers all but done with;  $5 = \ddot{v}pte = the$  notched off.

In the Botocudo vocabulary, one of the most exiguous of all, we find merely mokenam (1). Anything greater than 1 is called uruhu—i. e., uruhu means either 2 or many.

Even more poverty-stricken than this, according to D. G. Brinton (*Essays of an Americanist*), is the numerical language of the Chiquitos of Bolivia; for these practically wanted all numeral-words. The number 1 was expressed by *etama* meaning "alone."

Other authorities may be consulted with profit. Among these might be mentioned Sir John Lubbock who has reported (*Prehistoric Man*) that many native Brazilian and Australian tribes were found by him to be unable to numerate above 3 or 4; and the traveler, Dr. A. E. Meyer, who found that the Arfakis of New Guinea counted accurately only to 5, proceeding beyond this with extreme difficulty, and coming to a painful and final halt on reaching 20 (the number of their fingers and toes). See also Fr. Müller's Sprach-

wissenschaft, Schoolcraft's works on the American Indian, E. M. Curr's The Australian Race, and contributions made by Franz Boas to the Sixth Report on the Indians of the Northwest and Proceedings of the British Association for the Advancement of Science, 1889.

Now, what do such citations prove? At least one conclusion which they point to is fairly obvious, and not open to a great variety of interpretations. And that conclusion is this: nearly every savage or primitive tribe possesses a name for a group of objects, the baffling multiplicity of which defeats the actual ability to enumerate them either by naming these objects individually (i. e., by putting them into correspondence with formal symbols), by relating them with a set of other objects (e. g., fingers and toes). or by both methods of thus consolidating and clarifying first impressions. In brief, we shortly are led to this belief: viz., when names for succession are exhausted, a name is suggested by and is applied to that identical circumstance. The New Hollander says bool-tha-bat when he meets this circumstance, the Tasmanian says cardia when he meets it, and so on. Moreover, we ourselves signify by the words and so on almost exactly what the primitive signifies by bool-tha-bat, by prica, or by cardia. He means, as we mean, that the formal system, till then in force, collapses.

What we would bring out is, then, that primitive minds, no less than those more cultivated, have a mnemic verbal order-system not more certainly than both have a name to indicate the exhaustion of that system. The name may be bool-tha-bat or prica, "many," or "multitude," or "infinite number." But in every case the word used is a mark, either of the exhaustion of the system in force, or of the fatigue of him who was using it. It is true that the Arabic notation is so framed as to allow of indefinite industry in counting. This is a manifest convenience. It does not

alter the fact, however, that the elements of that scale are but ten in number, and that no number greater than ten can be inscribed save by repeating one or more of these symbols; nor does it alter the fact that verbal or oral enumeration (except by means of which these numerical symbols can not be intelligibly translated) halts, formally, at least, when we reach a decillion: further progress is purchased by repetition. All this thus leads back to the conclusion already suggested, namely, that bodily mimicry or the gesture language, being anterior to symbolic counting as well as posterior to the exhaustion of his symbols, quite reasonably may be interpreted as responsible for the savage's feeling that beyond all his numbers there are others; and we think it would be difficult to prove that the feeling of a Cambridge professor is different. For the feeling is easily analyzed into primitive emotions. At least until some psychologist corrects us, we shall persist in the belief that the feeling of which we speak is occasioned by nothing, as it is translatable into nothing, but the memory of an act of repetition.

#### V

It is probably true, it should be added as a postlude to the inquiry we have conducted, that many writers who use the words "infinite number" do so from carelessness merely; and they are thus to be censured no more strongly than many of the contemporaries of Aristotle who, as Gomperz<sup>77</sup> has said of them, "where they really desired to speak only of vast numbers and huge spaces exceeding all possibility of human measurement, used the words 'infinite' and 'infinity' with a careless indifference to the consequences which might be drawn from those terms." Such writers, who offer no formal defence of their terms, invite no formal criticism. Yet, as we have seen, even the in-

<sup>77</sup> Theodor Gomperz, Greek Thinkers, 1912, Vol. IV, p. 122.

formal usage inclines to be dangerous, for it tends to crystallize rapidly into an idiom. And it thus becomes a subtle menace, and an ever-present one, that drives the mathematical analyst into fields as foreign as ethnology. But our excursion therein, if a little irregular, is, we hope, for that very reason, profitable. We should not have entered upon it unless we had believed that the scant attention customarily paid to the concepts of primitive peoples is in inverse ratio to their mathematical significance. Nor do we think that there is any lively prospect of mathematical logicians' putting their science on a reasonably sound footing until they accord more attention than is their wont, not only to their own well-lubricated mental machinery, but also to the mental creakings and groanings of their forebears. The comparison is naturally distasteful; from those to whom it is especially obnoxious we hence are justified in expecting the earliest answer. If it is demonstrably untrue that the savage's word for "many" "plays the same rôle in the language of the savage," as Leland Locke<sup>78</sup> puts it, "as infinity in ordinary parlance," such a demonstration will undoubtedly be forthcoming. Until it arrives, conceit may profitably be tempered with modesty. The ancient Egyptians, we are reliably informed, 70 expressed the number 1,000,000 by portraying a man in a pose of astonishment. Between the number 1,000,000 and the number 20, in the presence of which the negroes of Surinam (perhaps under the instructions of an Ethiopian Cantor) cry wiri-wiri, there is some numerical but little psychological difference. And it may be suspected that there is no more difference between our own English cry of infinity and the Egyptian ideograph or the Ethiopian polysyllable. Circumspection is enough, at any rate, to induce

<sup>75</sup> L. Leland Locke, in The Science-History of the Universe, 1909, Vol. VIII, p. 4.

Moritz Cantor, Vorlesungen über Geschichte der Mathematik, 1907 Bd. I, 3. Aufl., p. 82.

the horrid fear that our polysyllable means merely that, although the white man can carry a heavier burden than the black, he also, like his dark brother, can grow weary.

In the literature of mathematical logic such antiseptic labors as we have expended are not wanting. On a priori grounds alone, we might in fact have assumed that even restating the problem was unnecessary, since it was adumbrated two thousand years ago by Aristotle, and often since has been iterated and expanded by his followers. We should have fancied that the difficulty was long ago settled. Unhappily, experience has robbed us of that illusion. If the early Eleatics, 80 Aristotle, 81 Hobbes, 82 Locke, 88 Hume, 84 Berkeley, 85 Kant, 86 James Mill, 87 Alexander Bain, 88 Gersonides, 89 Spinoza, 90 Leibniz, 91 and more recently, Sigwart, 92 Vaihinger, 93 Hardy, 94 and Hobson 95 -not to mention such historic mathematical figures as Descartes, Gauss, D'Alembert, Hermite, Cauchy, De Morgan, Poincaré and many others—have criticized the notion of "infinite number

1, 36, 2 and 38, 2.

81 De Caeo, Bk. I; Physica, Bk. III; Metaphysica, Bk. X.

82 Concerning Body, 1656, Ch. VII. Cf. also H. Höffding, History of Modern Philosophy, translated by Meyer, 1920, Vol. I, p 272.

83 Essay Concerning Human Understanding, Bk. II, Ch. XVII, passim.

84 Treatise of Human Nature, Bk. I, Secs. 1, 2, 4.
85 Of the Principles of Human Knowledge, Pt. I, Secs. 128-33.

86 Critique of Pure Reason, Div. II, Bk. II, Sec. 2; Dissertation, 1770, \*1, n; cf. also, N. K. Smith, A Commentary to Kant's "Critique of Pure Reason," 1918, pp. 483-8, 507-9. Metaphysical Foundation of Science, trans. by E. B. Bax,

1883, p. 180.

87 Analysis of the Phenomena of the Human Mind, Ch. XIV, Sec. 4.

88 Mental and Moral Science, 1878, Pt. I., p. 49.

89 Milhamot, p. 345; discussed by I. I. Efros, The Problem of Space in Jewish Mediaeval Philosophy, 1917, pp. 99-103.

90 Ethics, Pt. I, passin; Letter XXIX (XII) to Lewis Meyer.

91 New Essays, Bk. II, Chap. 17.

92 Logic translated by Dendy, 1895, Secs. 66-8.

93 The Philosophy of "As If," pp. 52, 62, 73, 236-45.

94 A Course of Pure Mathematics, 1921, p. 112: "There is no number lines."

of A Course of Pure Mathematics, 1921, p. 112: "There is no number 'infinity'."

<sup>95</sup> The Domain of Natural Science, 1923, pp. 121-2; Mr. Hobson, like Mr. Hardy, in his criticism of infinity is not entirely consistent, but a single sentence from this work may be quoted: "I would suggest that extreme caution should be exercised in attempting to extend results of such a theory as that of transfinite aggregates, to a domain other than its original one."

<sup>80</sup> O. E. Erdmann, History of Philosophy, translated by Hough, 1910, Vol. I, 36, 2 and 38, 2.

and magnitude" to so little avail, it might indeed appear as if the present age felt some deep-rooted and reasonable antipathy to the past; that the current conspiracy against the opinions of such men rests on the conviction that all of antiquity, besides being incurably old-fashioned, was hopelessly wrong. On no other grounds, assuredly, is it easy to interpret the disrepute into which such writers have conspicuously fallen, for their arguments more often are simply ignored than even carelessly answered.

Yet such a conclusion, we realize at once, can not be wholly accurate, when we observe how many favors are today being bestowed upon arguments like Salviati's, themselves more than four hundred years old. The prejudice, it begins to be clear, must be less obvious than we hastily might have imagined. Is it perhaps based on such a passionate affection for the past that only the echoes of prehistoric thought are certain to awaken in modern thinkers a semblance of interest and regard?

The deduction, if presumptuous, is persuasive. There is something fabulous, and distinctly more Homeric than mediaeval, in the modern mathematical realists' acceptation of the infinitely great and their repudiation of the infinitely little.<sup>96</sup>

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W. J. KINGSLAND, JR

be added ateleutauxeteontic and ateleutophthinontic. We offer these Greek polysyllables, substitutes for the "infinitely" great and small respectively, to those who may find that they chafe under the necessity of using the homely and humble English word, indefinite. Since our neologisms posses, in addition to logical nicety, a great share of consonantal magnificence, we have no doubt that they will prove extremely attractive to the ocular appetite of the transfinitists.

#### CRITICISMS AND DISCUSSIONS

### REALISM AND EVOLUTIONARY NATURALISM: A Reply to Professor Hoernlé

In a recent number of this magazine, \*Professor Hoernlé selected the positions and arguments of Lloyd Morgan and myself for critical analysis from the point of view of idealism. It was almost hinted that the advocates of naturalism were more familiar with their science than with their philosophy. The article was, in truth, a challenge to the naturalistic movement to defend itself against the double charge of dialectical incompetency and lack of awareness of the rightful approach to theory of knowledge. And yet the article was fair and showed familiarity with much of the material.

The contrast of principle and method brought out by Hoernlé is one of those illuminating things which justify controversy. Sharp divisions in philosophy bring out the problems which must be subjected to exhaustive analysis. While in this instance much of Hoernlé's argument could have been anticipated by those who have read his books and have known his adherence to the main theses of Bosanquet, there was yet the advantage of detail. Idealism stands precisely for this and this; and it opposes naturalism on this count and this other count.

The article falls into two parts. The first part is concerned with dialectic or with the general nature of reality and the validity of certain categories, while the second part deals with epistemology. I cannot do better than follow his outline, and I shall quote where the argument demands it.

He begins with a sketch of the first epoch of evolutionism and shows that philosophy has concerned itself more with the *genetic* outlook than with the details of biological theory. He then proceeds to contrast the positions taken by Alexander, Lloyd Morgan, Bergson and myself. On the the whole, Alexander is the thinker who

<sup>\*</sup> The Monist, Oct., 1926.

takes evolution most seriously. He has speculative scope and imagination. "What Sellars values in the evolutionary point of view is the aid it lends to a naturalistic theory of mind, by treating mind as a product of evolution in the context of the physical world."

May I point out in this connection that both Lloyd Morgan and Alexander have a more monistic tinge to their thinking than I have. For them, there is an underlying nisus to the whole cosmos and this nisus gives a unity which is alien to my more pluralistic outlook. I would refuse to say that I take evolution less seriously than they but would admit that I take it more empirically and distributively.

The first problem is this, Where shall we draw the line between the metaphysician and the naturalist? "Indeed, if it is the mark of a 'metaphysician' to go behind the scientifically ascertainable facts of evolution, whether on the biological or the cosmic scale, in the search for a source or cause (agent) of evolution, then even Lloyd Morgan is a metaphysician, and Sellars's type of theory the only genuine 'naturalism.'" Now I quite accept the reality of some such contrast. In an appendix to his Emergent Evolution, Lloyd Morgan was good enough to call attention to the difference in our outlook. But I don't like to be refused the name of metaphysician nevertheless. I am not a positivist who limits himself to scientific facts for I am a realist and a believer in categories. For me, the task of the philosopher is to analyze concepts and principles and to perform a labor of synthesis. It is true that I regard nature as a self-sufficient system, that is, as reality. I see no reason to acknowledge an Activity back of the processes of nature as a patterned complex. But surely such an acknowledgment is not the differentia of a metaphysician!

Since I have not hitherto availed myself of the opportunity given me by Lloyd Morgan in his extremely just contrast between his position and my own, I feel it is only right to refer to it here. My query is this, Is not his acknowledgment of an Activity a hold-over due to several causes? To what extent the traditions of past religion have entered he can say better than I. I have a shrewd suspicion that an acknowledgment such as he works with must have a psychological basis since it does not arise from the objective content of knowledge but is added to it. He seems to admit that the facts known are satisfied by naturalism. But there is a more technical point. Was not past naturalism supposed to be bound up with

agnosticism? And it is well known that agnosticism easily allied itself with theism, witness Spencer. If you don't know reality, why not there of necessity, but is there as a sort of inheritance from his more than a trace of agnosticism in Lloyd Morgan's position. It is not necessarily there, but is there as a sort of inheritance from his period. Note the following quotation from Emergent Evolution given by Hoernlé: "The more adequately we grasp the naturalistic and agnostic position, the more urgent is the call for some further explanation which shall supplement its merely descriptive interpretation." Does Morgan take descriptive interpretation to be penetrative knowledge? Or, in other words, does he look upon a physical system as an agent? Is the physical world a shell or a self-sufficient reality? For my part, the substitution of critical realism for agnosticism seemed to transform naturalism into a new naturalism which may rightly be called physical realism.

I would reply to Hoernlé, then, that I am a cosmologist and ontologist if not a metaphysician in the literal meaning of that term.

That there are unsurmountable dialectical weaknesses in the admission of emergent novelties appears to Hoernlé a matter of common belief. But I take it that he is speaking here for the objective idealist and that pragamatists and realists have long opposed this opinion. The evolutionist has good company. But, of course, this appeal to support is not argument for either side. And clearly the problem is so basic that I cannot do better than refer to my own detailed analysis of time and change in my Evolutionary Naturalism. Having this context in mind, I can point out wherein I deny the validity of his refutation of change.

"Creative evolution," writes Hoernlé, "clearly belies the old principle, Ex nihilo nihil fit. For it there is always more in the 'effect' (the later stage) than there was in the 'cause' (the earlier stage)." But it seems to me that this old principle is nothing more than the assertion of the principle of causality itself. It is the demand for a ground, or a sufficient reason, for an event. Taken in this general sense, it stands for the denial of the complete origination of being and against absolute beginning. But novelty in the modern sense is always relative beginning. It arises within a system as intrinsic to it. Let it be remembered that the evolutionist affirms only those novelties which are attached to organized stuff and are inseparable from it. Novelty involves its conditions and antecedents. Surely

Hoernlé would not take this scholastic principle to be intuitive and unambiguous!

Hoernlé makes much of the phrase, "the universe as a whole." Being a pluralist in the general modern sense in opposition to singularism, I take the universe distributively in my thought as a spatiotemporal system. I would not speak of evolution as applying to the universe as a whole in a unilinear way. The universe is for me a stereometrical system in which changes with different directions may go on simultaneously. I would, indeed, admit that change applies to the universe collectively because it applies distributively. I would even admit that changes reverberate all through the universe in some degree, the degree to be determined empirically. But surely this does not imply organic evolution for the sun or for the sidereal system as a whole. There may be evolution in one locality and devolution in another.

With this introduction, let us examine Hoernlé's argument. "The whole cannot change. . . . It cannot change, because any change introduces something that is, and this, ex hypothesi, falls within the whole. The whole, if it changes, was not the whole, but something less." But change does not introduce anything new from outside. If the whole has four dimensions, it is of its very nature to alter. Development is within reality and has its conditions and continuity. This difference of opinion depends upon the starting-point, and I claim that the admission of change within the identity of a system is more in accordance with experience. Ultimately, I suppose, the divergence between critical realist and idealist turns on the acceptance by the former of identity of existence as other than logical identity of universals.

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Let us now pass to the problem of the nature of knowledge. Hoernlé is clearly right in his opinion that it is basic to naturalism as a philosophy and not merely a scientific generalization. However he implies that the naturalist is more a scientist than a philosopher and has misunderstood and confused problems.

It may be of interest to point out that many American thinkers are seeking to put mind in nature and to avoid the traditional dualisms which have teased philosophy. Hoernlé's charge found me somewhat incredulous since I had felt myself more philosophic in

this matter than Dewey or Woodbridge in that I stressed the importance of epistemology. Had Hoernlé read my Critical Realism or my The Essentials of Philosophy or the other work in which I devoted my attention to epistemology? In the essays to which he refers I had taken this prior work for granted and the stress was upon the naturalism.

I would put my argument in this way. I have worked both from the side of naturalism to theory of knowledge and from the side of theory of knowledge to naturalism or, if you will, physical realism. And I have found that these two ways of approach re-enforced each other. Thus I quite agree with Hoernlé that "if the account given of knowledge as a phenomenon in nature is such that it throws doubt on our knowledge of nature . . . . the argument destroys its own basis."\* Only I have found that the two ways of approach harmonized.

Let me come to detail. "I draw attention, at once, to what is the crucial point, viz., the 'naturalistic' context in which the analysis of mind and knowledge is to be undertaken." But in critical realism my beginning was the context of natural realism, that is, the structure and meanings of experience at the level of perception. In this I have agreed with much of epistemological exploration in this country, England, and Germany. Does natural realism break down under persistent reflection, and does this breakdown lead to idealism or to a more critical type of realism? As a critical realist, I have concerned myself with the second query which he outlines on page 571, namely, an inquiry into the truth-claim of perceiving, thinking, reasoning as such. It has been my endeavor to show that traditional representative realism made certain corrigible errors. And I was pleased to find that Professor Hoernlé was struck by the ingenuity and clearness of my correction. But if knowledge consists in the comprehension of the characteristics of an object by means of, and in terms of, characters held before the attention in the act of knowing and if such a claim can be tested by such criteria as consistency, guidance and prediction—and such is the outlook of critical realism as I champion it-wherein am I untrue to the standpoint of epistemology? Is not such knowledge, so tested and interpreted, something which can be sustained by individual minds in responsible relations with their environments? In other words,

<sup>\*</sup> p. 570.

knowledge is inseparably connected with knowing, and knowing is a complex act which has its nature and conditions which must be studied empirically. Will the naturalistic context or, if you will, the content of knowledge cast light on the act of knowing? I believe that it will.

In short, I am certain that I have never confused these two questions in my own mind. And the space I have given to both critical realism and to naturalism as separate investigations is my vindication. It is just possible that Lloyd Morgan in his first systematic work kept the two questions very closely together by his way of approach. I am sure, however, that he saw the difference between them.

May I, in conclusion, again express my belief that such frank criticisms as the one I am answering are very valuable in philosophy. There are too few of them. I await Professor Hoernlé's reply with interest. I hope it will take the form of a criticism of critical realism along the lines sketched by Bosanquet, a criticism which I regard as about the best offered and which I have had in mind in my recent formulations. May there not be cognitional identity between content of knowledge and the characteristics of the object of knowledge without existential identity of thought and object? Had the idealist laid more stress on the existential side, upon the act of knowing and the object of knowing, he would, perhaps, have better understood both the nature of knowledge and its limits.

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#### REALISM AND EVOLUTIONARY NATURALISM:

A Reply to Professor Sellars

T HE Editor of the *Monist* has very kindly sent me the typescript of Professor Sellars's *Reply* to my article in the preceding issue, with the offer to publish together with this *Reply* anything further which I might wish to say.

I gladly avail myself of this opportunity, even though I can do so only to a very limited extent. For, even if the Editor had been able to allow me more time, other work in hand, which does not brook long interruption, would have prevented me from responding just now as fully as I could have wished to Sellars's invitation that I should develop a "criticism of Critical Realism along the lines sketched by Bosanquet." In order to do this adequately, it would have been necessary for me to re-read Sellars's books in the light of what he says in his Reply, and perhaps the writings of other Critical Realists, too. But this, as I have said, would divert me too completely from other work to which I am committed, and I must regretfully on this occasion content myself with something less.

First of all, I wish to express my appreciation of the manner of Sellars's reply. It is a pleasure to debate with a thinker who meets one's criticisms in the spirit in which they are offered. Indeed, it is more than a mere pleasure in controversial fairness and good will: it is a real help to one's own philosophical thinking, i. e., to the clearer definition of issues and of differences in points of view. I have always delighted in, even when I have not agreed with, the clearness and force of Sellars's handling of philosophical problems, and in arguing with him I feel that our minds meet on the points at issue, and that we are not merely staging a shadow-fight at crosspurposes.

And, turning now to the substance of Sellars's Reply, I find it to be what I had hoped it would be, viz., a further explanation of his

position in respect to the issues I had raised. Whether he has "replied" to me successfully, in the sense of having rebutted my criticisms, is to me a minor point. What I value most for my own understanding of his position is the fresh light which, for me at least, he has thrown on it in his Reply.

Let me run through the points of his reply in order.

- 1. Sellars denies that he takes evolution "less seriously" than Alexander. Well, I had used the phrase, "taking evolution seriously" in the sense of taking an interest, not only in the past levels, or stages, through which the universe has evolved, but even more in the future levels or stages towards which it is evolving, and especially in the attempt to characterize the next stage ahead of us (e. g., Alexander's "deity"). In this problem, by his own admission, Sellars is not interested (cf., in his Reply, "I would not speak of evolution as applying to the universe as a whole in a unilinear way"). Perhaps he would say-and, if so, I should agree with him —that the problem, so put, is not in the last analysis either soluble or even intelligible. But, at any rate, it is a problem that looms large for many evolutionists, and one into which reflection on cosmic evolution readily falls. Hence, to my remark that Professor Sellars does not "take evolution seriously" in this sense, it is no reply on his part to say that he takes it seriously in another sense. On the other hand, his contention that his outlook is more pluralistic and empirical than that of Alexander and Lloyd Morgan, is, in itself, both true and important; and it is well to be reminded afresh of this difference.
- 2. As for being a "metaphysician," I had used the term (as I tried to hint, in the context, by the use of quotation marks) in the sense which is usually given to it by Positivists. Hence I welcome Sellars's explicit dissociation of his position from that of Positivism. I agree most heartily with his own definition of a metaphysician as a "believer in categories," and as one who regards reality as a "self-sufficient system." I think I have as little use as he for the way in which Lloyd Morgan introduces God into his scheme as an activity behind and beyond the evolutionary process. Where, as fellow-metaphysicians, we differ is (a) in that he conceives reality more pluralistically than I do; and (b) in that I do not see my way to identifying the "self-sufficient system" with Nature. Of course, "Nature" is a horribly ambiguous term, and everything

here depends on what the term includes and excludes. As I use the term, Nature is something less than the whole of Reality—an "aspect" of it corresponding to a certain point of view. Or, to put it differently, the theory which identifies Reality with Nature is, to me, a synthesis of only certain types of experiences to the exclusion of other types, and, especially, so I suspect, of the religious type. And by "experience," here, I mean what Reality reveals, or discloses, itself as being in certain types of experience, i. e., what in these experiences it is perceived, thought, felt to be. Hence, the issue between Sellars and myself comes down fundamentally to this: what experiences (in the sense just laid down) are we using, in our metaphysical theory, and how are we using them, i. e., how do we rank them as clues to the whole nature of Reality?

3. In turning to emergence, and novelty, and the principle, ex nihilo nihil fit, I come upon the only point on which we are, perhaps, a little at cross-purposes. Of course, I do not claim for this principle, or for any principle which is capable of divergent interpretations, that it is intuitive or unambiguous. And heaven forbid that I should be understood to deny that novelty-itself an ambiguous term!—"involves its conditions and antecedents." No. where we are, I think, at cross-purposes is in this, that Sellars defends his own position against certain criticisms which, in my mind, were directed, not against him, but against Alexander, Lloyd Morgan, and others who apply, as I understand them, the concept of evolution to the universe as a whole, and construct a progression of stages or levels such that, at each succeeding level (commonly called "higher") a new quality emerges in the cosmos for which in the nature of the preceding ("lower") stage no intelligible explanation is to be found. This, I understand, is not Sellars's view and with his "relative beginnings" and "changes reverberating all through the universe" I have no quarrel. The difference between the view I am criticizing and the view which Sellars holds comes out clearly in a sentence toward the end of the first section of his Reply, in which he says that organic evolution on the earth does not imply organic evolution for the sun, and is compatible with devolution elsewhere. By contrast, I understand Alexander, Lloyd Morgan, and others to be speaking, not merely of organic evolution on this planet. but of evolution on a cosmic scale—in fact, of the universe as a whole undergoing evolution. Thus, Sellars is defending himself against a criticism not aimed at him. But his defence is valuable as bringing out clearly how different in his conception of evolution from that of other evolutionary naturalists.

4. Lastly, as regards knowledge, there are two points, so far as this present discussion is concerned, at issue between us. The first concerns the question which Sellars formulates in the words. "Will the naturalistic context or, if you will, the context of knowledge cast light on the act of knowing?" Sellars believes that it will. So do I, provided we take "acts of knowing" as empirically observable phenomena. But so to take them is, for me, to abstract from their cognition function, or truth claim, i. e., from a consideration of the question how far the "context" (the setting of other phenomena in which we take the facts to occur) is really what in these acts we perceive and think it to be. I agree with Sellars that such truth-claims can be, and are, tested "by such criteria as consistency, guidance and prediction." If they satisfy these tests, then we conclude that what we perceive and think is really so. But, such an enquiry into truth-claims seems to me, not only different from, but logically prior to, and more fundamental than, the enquiry which, taking the context to be "known" (i e., to be really what it is thought to be), now studies the empirically observable relation between this context and acts of knowing considered as empirical events. Of course, I am here merely repeating my original criticism, and in doing so I am merely saying that I do not see how Sellars has met my difficulty. To put this first point in a nutshell: Sellars claims that he has "worked from the side of naturalism to the theory of knowledge, and from the side of theory of knowledge to naturalism," and that these two ways of approach reenforce each other. For me, there is only one way, viz., from Nature considered simply as such, to Nature-as-known, i. e., to Nature as an object of perception and thought, and thence, lastly, to the problem of truth, i. e., the problem of whether Nature really is what it is perceived and thought to be-The second point is put by Sellars in the form of a question, "May there not be cognitional identity between content of knowledge and the characteristics of the object of knowledge, without existential identity of thought and object?" I can see why, with his way of approach, Sellars must distinguish these two kinds of identity. Does he, in turn, see why, on my one way of working back from Nature via Science to Truth, there is no room, or need, for this distinction?

Here, for the reasons given at the outset, I must regretfully leave the matter. But, I do not wish to retire from the discussion without thanking Sellars for having helped to make it—to me, at least—so illuminating.

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# THE MONIST

## HEREDITARY AND ENVIRONMENTAL FACTORS IN HUMAN BEHAVIOR<sup>1</sup>

TEARLY twenty years ago, after the publication of Mc-Dougall's Introduction to Social Psychology, the psychological and sociological worlds were swept with enthusiasm for a new key with which to unlock the mysteries of human behavior. At last, we were told, we should be able to understand not only why people did things, but we should be able in a large measure at least to predict what they would do and to control the behavior. Some of the social and educational technologists seized upon this theory as a new mechanism which reduced man to a sort of machine, almost an electrical machine, which would work automatically. Once the proper stimuli were given, the responses would follow of themselves. The age-old mystery of what was man, the inscrutable, was now practically solved. After all he was but an automatism, inheriting his systems of levers and pulleys, stop-cocks and spigots, from that romantic past, the fund of racial traits. All that remained to make the instinctivist theory a perfect solution of the whole problem of human behavior, and hence of social adjustment, was to get the proper classification of the instincts. Once this was attained it would function like a keyboard, giving the manipulator—whether he be parent, educator, public administrator, propagandist, or legislator—the cue as to what in-

<sup>&</sup>lt;sup>1</sup>Address delivered before the Iowa Association of Economists and Sociologists at Des Moines, May 1, 1925.

stinct to touch off in order to secure the proper response. To make the notation more accurate and dependable, elaborate systems of emotions and sentiments were also constructed to aid in the process of adapting response to stimulus.

Educationalists, sociologists, personnel men, social workers, humanitarians generally, began to invent their classifications of the instincts. No psychological or sociological writer was so poor as to be without a classification of his own, which was in many respects, he thought, better than the last previously to claim our attention. Some, like the Freudians, were content with one instinct, or at most, with two or three, and they quarreled over this slight extension of the number of instincts with the most ludicrous seriousness. Others insisted on a great many instincts, or original behavior patterns. You will remember that Thorndike filled a book with them. It all looked so easy then that textbooks, like the educational psychologies, and theoretical works for personnel men, like Ordway Tead's Instincts in Industry, were written incorporating this new revelation of the biological psychologists to the social scientists. It even went as far as economics and one of the fraternity, a very lovable personality with a leaning for Veblen and the psychoanalysts, brought in full measure his offering of (shall I say?) the new psychology to the new economics at a joint meeting of the American Economic Association and the American Sociological Society at Philadelphia, in December, 1917. As early as 1911 one of the distinguished sociologists, whom I shall not mention, because he has since repented, wrote me in righteous indignation protesting against my iconoclastic tendencies, asserting that sociologists needed nothing else so much as a firm scientific foundation for their subject, and that he had attempted to give it that in the application of the theory of instincts to the theory of social organization. He called upon me to desist from attacks which were, he conceived, like blows of an axe at the very roots of the sociological tree and to be a cooperator, not an environmentalist bolshevik. This appeal is now interesting only as an illustration of certainties about what would be tomorrow. Its author has now joined the ranks of those who see the error of the old instinctivist view, which found the social science panacea in a classification of complex patterns of original behavior.

My own disillusionment had come a little earlier. The International Prison Congress was to meet at Washington in 1910 and Professor Henderson, its president, had asked me to work over the old classifications of criminals in the light of the new psychology and if possible to devise a correct one. I found it an extremely difficult task to perform from the biological standpoint and finally came to a conclusion not wholly unlike that earlier reached by lawyers and jurists, that a fairly good way to classify criminals is by their crimes. The multiplicity of classifications of instincts presented by different authorities confused me. How could such a self-evident theory as that of the instinctivist interpretation of human nature lead to so much contradiction about the character of the instincts? No two of these classifications agreed. And soon I found so many obvious errors in their theories of inheritance and so much disregard of the patent facts of environmental conditioning of responses that I decided to abandon the attempt and to try to find out, if possible, what the true instincts were and how they affected human behavior. I have searched long, and, I fear, largely in vain. If my results are mainly negative with regard to instinct, I trust that they are not wholly so with reference to environment. Not that I do not believe there are instincts, and that man has his share of them, although the requirements for adjustment to a highly complex and acculturated environment have caused some of his instincts to be disintegrated or rendered vestigial.

But the most important conclusion which I have reached

in connection with the theory of instinct is that almost all of the so-called instincts in these classifications are not instincts at all but are rather habit complexes or even abstract value and meaning complexes, sometimes of the greatest abstractness and complexity. The true instincts are largely of the simple character of reflexes, which, together with acquired elements of behavior, are organized into habit patterns, and are usually connected with the vegetative process instead of with the more abstract and intellectual adjustments of life. This organization of original behavior patterns into more complex habit systems and processes takes place under the pressures of environment, especially under those of the psycho-social environment. Lower animals are able to make their relatively constant and simple adjustments to their simple natural environments largely on the basis of instincts, or at least in the basis of simple and concrete overt habits. They live in a world of the non-intellectual or of the appetites and the senses. If they fail of effective adjustment, death is a matter of relatively little consequence in their social economy, for abundant reproduction will more than replace such losses.

But not so with man. His intellectual powers have created for him an environment of surpassing richness. His inventive processes have transformed the natural physical and biological environments into derivative physicosocial and bio-social environments. He has fabricated tools, clothing, weapons, ornaments; constructed machines, apparatus for communication and transportation, and has built cities. All of these are his physico-social environment which stands between him and nature with which once he came directly in contact through his bare hands. He has also lured and domesticated and trained the biological environment of plants and animals, until this aspect of his natural environment has been transformed into a bio-social environment of much greater complexity and one that is

much easier for him to manipulate. But man's crowning achievement in the creation of environments is the psychosocial environment, the new world of meanings involved in language and other contact symbols, of psychosocial organization, such as traditions, customs, beliefs, conventions, mores, folkways, etc., and finally of objective social organizations as such, embraced primarily in the social institutions. These, like the other two more material social environments, are the product of man's reaction upon nature in his collective life adjustment process, and they have come, as they grew rapidly in volume, to stand largely between man and nature as the environments to which he has had to make his adjustments most immediately.

This multiplication of environments, ever increasing in volume and complexity, has reacted back upon human nature itself and forced the building of ever more intricate adjustment habits within the individual. The process is reciprocal. The social environments are either material objects created by habit variations, or they are themselves the acquired habits of men viewed collectively and funded as it were in the complex of culture, reacting back upon their possessors, but especially upon the new generations, to compel them to make ever new habit adjustments to the growing environment which they create. Thus the process is an endless chain. Habit variations from instinct create a new and social environment, of either a physical, biological, or a psycho-social type, and this new social environment calls ever for new adjustments. Whatever instincts man possesses are not capable of making these adjustments to so complex an environmental system. Even in infancy the instincts begin to be buried under a mass of acquired technique or habit behavior formation; and in many cases the instincts, considered as complex behavior patterns, as distinguished from reflexes, do not have an opportunity to appear. This is true of the delayed instincts. Even the child's inheritance is somewhat selected in the direction of the elimination or breaking down of certain instincts by the domestic environment. The care of the family, especially of the mother, has relieved in large measure the infant of the necessity of taking care of itself. Consequently it has lost the power to find and procure its own food at birth, to walk or swim, to seek cover, and similar things which may be done by other animals. The environment makes for it the adjustments to the survival process which the inheritance has lost the power to do. And gradually the environmental pressures organize the native mechanisms of the infant into such behavior patterns as will enable it to make its adjustments to its environment. But these new and socialized adjustments are entirely too complex and abtract, in most cases, to have been made by the instinctive equipment, even if it had remained intact in the child. Hence the necessity of the replacement of instinct by habit or acquired behavior mechanisms, by means of this indirect and somewhat lengthened process of the disorganization of the inherited adjustment patterns on the one hand and of the building up of acquired adjustment patterns on the other hand, both occurring under the dominance or direction of the environmental complex. It is a necessity because of the new problems of adjustment to a rapidly changing and highly complex socialized environment which confront each new generation of men.

When I began to make a collection of instincts in order to determine if there was any agreement among writers regarding the true instincts, I discovered a most astonishing thing. I examined nearly six hundred volumes by over five hundred authors and discovered approximately six thousand separate classes of more or less complex instincts, as distinguished from reflexes, under nearly fifteen thousand different forms. And when I stopped, because of fatigue and the limitations of time and money, new addi-

tions to my collection were coming in strong. My experience in collecting instincts leads me to believe that to the inventiveness of writers in creating new instincts of a complex character there is practically no limit. I was almost tempted to believe that if one searched long and far enough for it he could find an instinct predicated for practically every type of human behavior known to man.

This view seemed to be borne out by the character of some of the samples of instincts which I found in my researches. Under the heading of peculiar instincts I have discovered such examples as these, in which the behavior is obviously acquired: "The drayman's instinct of chivalry" (Dawson), "Instinct of the desire to liberate the Christian subjects of the sultan" (Pares), "Christianity was born with the imperishable instinct to impregnate the meanest man with its soul" (Ross), "Instinct to mummify and photograph the corpse" (Jelliffe), "Instinct to offer himself as a sop to conventional honor" (Hergesheimer), "Instinct for engaging the grocery man in conversation while a companion makes off with the bananas" (Lee), "Instinct of the priest and soldier to exterminate their rivals" (Adams), "Instinct of an angry community to refuse cooperation" (Ross), "Instinct for stealing street signs, gates and barber's poles (Lee), "accountant's instinct to put aside realized income in favor of earnings" (Fisher), "Lamb had a fine instinct for apocalyptic passages" (Nation), "Instinct of the girl to arrange her hair" (Smith), "Instinct which distrusts the intrusion of the middle man in the supply of those services which require the highest and most delicate mental qualities" (Marshall), "Instinct to hide himself from the queen he had not died for" (Beerbohm), "An instinct in the Jew against Terefa, unclean food-i. e., unfit for consumption by the Chosen People, or prepared by non-Tews" (Fishberg), "Instinct of the Jew for corporate action in the booming of what he wants boomed and soft-pedalling what he wants soft-pedalled" (Belloc), "Instinct in man to grow upward toward the light of his ideals, as a flower toward the sun" (Convict O. L. S), "The instinct of the savage . . . to ascribe an indwelling life to everything that moves, from the sun in heaven to the rustling leaves and the stones that roll from the hillside across his path" (Clodd), "Instinct for upholding the status quo" (Russell), "The first instinct of the capitalist is to retain counsel, not to advise him touching his duty under the law, but to devise a method by which he may elude it, or, if he cannot elude it, by which he may have it annulled as unconstitutional by the courts" (Adams), "Instinct of women, that they all worship strength in whatever form, and seem to know it to be the child of heaven" (Meredith), "The primal instinct of every female creature to battle for the male she feels is hers" (Minneapolis Journal).

A few examples of the use of the term instinctive when something else is meant may be cited: "Men act reasonably by instinct" (Bury), "A voluntary and conscious action can, under certain circumstances, become instinctive" (Chatterton-Hill), "Instinctive actions founded upon repeated and unrecorded experiences of an analogous kind" (Addams), "No nation acts more upon instinct than the British Nation" (Dawson), "The process of marketeering we may therefore interpret as the instinctive adaptation of individuals struggling for survival in a regime, ostensibly at peace, but nearer in reality to war" (G and B), "The method which he (the average citizen) instinctively adopts is to get up a petition of thousands of names and send it to the legislature" (Veiller), "Instinctive alliance of the Woman Suffrage movement with the uncertain and dangerous elements in our political life" (Johnson), "Amenities become instinctive when they are insisted upon in early life" (Small and Vincent), "The test of sanity which everyone instinctively applies is that of a certain tact or feeling of the social situation" (Cooley), "Goldsmith . . . seems instinctively to have apprehended the conditions of change in Europe" (Pearson).

Such errors as these, where the writer is simply misusing the terms instinct and instinctive to cover an acquired behavior process because it was reflectively automatic, recurrent, unconscious, or possessed some other quality similar to the stability of instinctive behavior, are not so difficult to correct. To a person who understands the Mendelian theory of inheritance it is necessary merely to point out the example to convince him of the misuse of the term in these cases. In each instance the behavior is obviously acquired. It is the sort of mistake which would not surprise us greatly in literary writing, where we should not particularly expect the author to be familiar with the distinction between instinct and habit. But this sort of error seems to occur almost as frequently among many of the writers on historical, sociological, and economic topics as among the writers of fiction and travel. The only explanation of this fact which suggests itself to me is that as yet many of our students of the social sciences, at least of those who are now writing books and articles, have not had as careful a training in psychology and biology as they might have had.

But a more serious form of the misuse of the term instinct was found to be the constant confusion of habit and abstract meaning and value complexes with instincts. If one who has thought seriously about the problems will go over the various classifications of instincts as they are presented in the many books dealing with this subject, or as they are produced in part in my book on *Instinct*, he will find that most of the so-called instincts in those classifications are not instincts at all. They are habit complexes, or even abstract meaning and value complexes, which never could be reduced as a unit to overt behavior at any one time. Take, for example, such frequently recurring so-called in-

stincts as the maternal, play, fighting, workmanship, or gregariousness. Imitation and self-preservation would have been equally good examples, but no one seems any longer to have any faith in these old standbys of a generation ago. I have analyzed several of these elsewhere and anyone else can do it equally well. All of them have much the same failing when it comes to quality as real instincts. Let us take, on a venture, the so-called instinct of pugnacity or fighting instinct, because it is supposed to be such a universal trait in mankind, at least among occidentals.

Now an instinct is by common agreement something which is inherited. If there is a behavior pattern which is not inherited we call it a habit. The distinction between habit and instinct depends on the fact of inheritance and non-inheritance. Furthermore, what is inherited is always a material thing, not something immaterial or abstract and conceptual. All inherited things are concrete. They are unit characters and must be capable of being passed down through the chromosomes, or at least through definite structural elements of the cytoplasm, if we accept some other theory of inheritance than the Mendelian. I believe that no one would seriously contend for the direct inheritance of an idea or a value or an abstract quality. All inheritance is of structure, of biological structure. stinct, therefore, consists of inherited neural behavior patterns, in which the end organs of the sensory system have an inherited susceptibility to certain types of stimuli which set in operation a series of connected neurons, whose synaptic connections as predetermined in heredity, and which lead over to a final muscular or glandular response, the mechanism of which is also predetermined in the inheritance. Instincts, therefore are primarily inherited neural and neuromuscular and neuro-glandular structures. Organs, as distinguished from instincts, are organized tissue structures. either neural or non-neural. Instincts usually predetermine the adjustment of the organism as a whole, or at least a considerable portion of it, while the organ has a more limited function. Instincts are therefore usually more complex and more particularly concerned with adjustment behavior. On this understanding of instinct I believe all careful writers are agreed. It is difficult to see how an instinct, as well as an organ, could be anything less than structural. Biology knows no inheritance other than that of structure.

Let us apply these simple facts about inheritance of instinct to the particular so-called instinct which we have selected for examination. If fighting is an instinct there must be some neuro-muscular and neuro-glandular structure which is the basis of this behavior. What is it? In order for it to exist it must have some form and occur in space, that is, be a part of the human anatomy and physiology. That means, of course, that this structure must be a unit. What then would the unit neuro-muscular and neuro-glandular structure for fighting be? We discover immediately upon reflection that there are literally thousands and tens of thousands of behavior processes involved in fighting. The fact of fighting is not a simple concrete unit act. We may fight with our fists, with our feet, teeth, nails, with clubs, guns, cannon, torpedoes, airplanes, battleships, armies, industrial organizations, vocal tirades, newspapers, books, white books, yellow books, green books, and a multitude of other things. Think how differently we behave in each of the processes of fighting mentioned above. See how different are the neural organizations and the muscular responses. Surely to group all of these complex and simple activities under one instinct term, which implies a unit behavior process, is not justifiable. Yet that is exactly what the instinctivists have done in cases too numerous to recount here. An abstraction has been mistaken for a concrete unit of behavior.

Then, if there is no instinct of fighting, perhaps there

are instincts of fighting. Possibly we can break up this abstraction or value term fighting into concrete component elements which are actual instincts. Perhaps each form of fighting—with teeth, hands, feet, clubs, swords, guns, pens, etc.—is a unit process and is also inherited, as such, and therefore an instinct. If so, we should not speak of a general fighting instinct, but of an instinct for fighting with the teeth, another for fighting with a gun, and so on. Some of these activities we will find are not inherited at all, for the instruments, like guns, cannon, warships, fountain-pens, are of too late an origin to have as yet selected and generalized over any large portion of the human race the behavior responses involved. Biting, however, is an old response and the mechanism is apparently or conceivably inherited. Then, have we not an instinct for biting? This is conceivable but still an instinct for biting is not an instinct for fighting.

At this point we have revealed a situation to which I cannot give as much attention as I should like. Biting is an illustration of it. We can and do bite many things besides people. Most of us, after early childhood, deny ourselves whatever pleasure there may be in biting people and confine our activities along this line to the less pugnacious attack upon food. The farmer may bite his plug of tobacco, the housewife her thread, the embarrassed young man his tongue, etc. I mean simply that biting is an interchangeable unit in behavior. It has little meaning in and of itself; for everything depends upon what is bitten. Biting is a structural mechanism which, like swallowing, may be instinctive and it is provided to all human organisms. But so far as we know, it is not characteristic of this mechanism that it must be exercised on any particular object. To be sure, objects to be bitten will be rejected if the organism gains no benefit from biting them, while others will be bitten if the process proves valuable to the biter. Thus we learn what to bite and what not to bite, and very early in our careers, as soon as we invent more effective methods of fighting, we learn not to bite other human beings at all. Therefore, I do not believe we can properly call the instinct to bite (if it is an instinct) a fighting instinct. The use of it in fighting, as elsewhere, is learned or adapted, not inherited.

The same principle of discrimination applies to other instinctive behavior processes which may be used interchangeably in fighting and in other complexes of behavior, such for instance as that of shrieking. It must be apparent, therefore, that the neuro-muscular responses afford no evidence of there being either a general instinct for fighting or specific fighting instincts apart from the employment of the same elementary and interchangeable instincts or reflexes in the service of other adjustment behavior complexes, like food getting, sewing, and the like.

If we examine the neuro-glandular responses involved in fighting, it may at first appear that we can make out a better case for an instinct of fighting on this basis than on the other. The stimulus which results in the fighting responses also calls forth a secretion of adrenalin which is thrown into the blood and results in a strong activation of the organism. Part of this activation is poorly coordinated, unless one's technique is especially good, and is therefore termed emotional behavior. The vascular system is worked over-time. Then is not this excess activation, sometimes called anger, which accompanies fighting the true core of the fighting instinct itself? Is not this the characteristic and unchangeable thing in the behavior process, as Mc-Dougall said? Many have thought so. But here also we find a difficulty. Practically the same sort of activation comes from numerous other stimuli and accompanies other types of response than fighting, such as fear, love, hate, strong patriotism, parental affection, loyalty to friends or a cause,

etc. The emotion is different in each case only on the recognitive side, which means that we recognize in ourselves, or at least experience, different attitudes toward the stimulus according to what we perceive or think the attitude or meaning of the object is for us. But the discharge and function of the adrenalin is the same in each case, except in amount or degree. And there is as much variation in this respect within anger as between anger and other emotions or so-called instincts. The final conclusion is that there is no way in which we can establish a distinct inherited general fighting mechanism or even several separate instinctive fighting mechanisms, distinct from other mechanisms of directly opposite signficance or meaning in collective behavior. All we can safely say is that there are certain instincts which the organism can use in fighting.

And what has been said here about fighting or the so-called instinct of pugnacity might equally well be said in slightly different terminology, and with reference to somewhat different mechanisms, of the so-called maternal instinct, acquisitiveness, self-assertion, self-abasement, gregariousness, and, in fact, of hundreds of other acquired value and meaning complexes which are miscalled instincts. These are not even unitary habits, for they never occur all together or at any one time or in any single place. They are abstract syntheses of behavior, which exist together only within consciousness. That is why when we call them value or meaning complexes instead of habits in the ordinary sense. They are in no sense properly termed instincts.

I do not want to make this analysis of the error of the instinctivists fatiguing, but I must mention one more idol of the forum to which they are inordinately attached. Many of them, even while they assert that psychology is a biological science, speak of "cores" and "tendencies" to act which are the heart of the instincts. In effect, they say that the overt responses or execution of the act may be acquir-

ed, but there is an inherited something within, which organizes these overt responses and which itself never changes. This is what McDougall termed the unchangeable central process of the primary and inherited emotion. Others call it a tendency; some an impulse. Others still seem to think of it as an immaterial mystical entity. This I suspect is the analogue of the old theories of spirits, which, like Socrates' Daimon ,watched over the behavior of their subjects and made them do what they desired. Really there is no such thing apart from the instinct itself. To see the fallacy of such a view we have only to remember that everything which is inherited biologically must be structural. What could this central core, impulse, tendency, or whatever it is, be except the neural structure of the instinct itself? It is true, of course, that every overt response has its corresponding internal neural organization. But these two together constitute the neuro-muscular mechanism of the instinct, or of the habit, as the case may be. If there is any directive factor within, we may be certain that it is not a mystical spirit entity, but this very inner neural mechanism of which we have spoken. And the arguments against the inheritance of complex instincts as a whole applies with especial force to the inheritance of this inner organization, for it is the heart of the behavior pattern.

Even more mystical and unverified is the object of faith of those who adopt a teleological view of instinct. They seem to hold that it does not matter what the responses are made of. They may be wholly acquired, but if the end or function of the behavior is determined by the nature of the organism the act is instinctive. I must confess that this reasoning is altogether too profound—or superficial—for me. It reduces itself to a complete absurdity in practice, for on this ground all behavior whatever should be instinctive, and I am convinced that at least some of it is not. I devoted several pages in a book I wrote on instinct refuting

just these arguments, and one psychologist promptly wrote me a long letter restating all the arguments in favor of the teleological view, as if I had not considered them, and said he did not know how they could be successfully met. Another psychologist reviewed my book and said I had proved the truth of the teleological view of instinct. It was all very bewildering. To me it seems the height of absurdity to suppose that we can inherit an end of an activity or that the inheritance of a mechanism can be stated in terms of the end or adjustment function of that mechanism. Inheritance can be described only in terms of the structure of the behavior pattern.

Then, if we are not creatures of instincts, what does dominate our behavior? If our behavior patterns are not inherited, whence does this organization arise? An older metaphysical answer might have been "From the will." But psychologists know that this will is only one of those anthropomorphic abstractions surviving from the metaphorical stage of mental and social sciences, used to indicate the direction which behavior takes as a result of the strongest motives and impulses. The will is no longer either spirit or divinity, but mechanism making adjustments. The factors, then, which determine any particular and immediate process of behavior are, on the one hand, the antecedent behavior patterns which have already been integrated in the personality as the result of impingement of environment upon the organic structure, inherited and acquired, and, on the other hand, the environment as it operates upon the organism at the time the behavior occurs. Thus environment, operating in the past to build up the accumulated behavior patterns and in the present to condition responses, is the most important factor in the control of human behavior. The cumulative effects of past environments upon the personality are usually more important in conditioning behavior than the effects of present environ-

ments. That is really what the metaphysicians meant by the hypothesis of free will. The personality does have more to do with the determination of conduct than present environments, but what the metaphysicians and the instinctivists failed to see is that the personality is itself determined primarily by environment pressures past and present. Nor does this fact deny the initial importance of inheritance. Man owes much to heredity. Most of the organization of his non-neural protoplasms and much even of his neural organization may possibly be traced back to inheritance, but the instinctivists should take note of the fact that the recent work of the experimental biologists, such as that of Child and Herrick, throws considerable doubt upon the inheritance of even these types of structures. Even if the foundations of his somatic organization and of his behavior are inherited, this inheritance does not equip him for modern collective life or even for individual survival. His instincts are too simple to direct his responses to the vastly complicated social environments, especially the pyschosocial, which have arisen out of the processes of his adjustment to what we call nature and to subsequently created environments. These socially organized environments have even begun to modify his inheritance, as we saw earlier, through their power of selection in the process of adaptation.

All of this seems patent enough when we stop to consider it. And yet seldom is its truth recognized. Human biology, most of psychology and the theory of education, and much of the social sciences, are now written from the standpoint of instinct domination. And yet these writings have not produced the evidence required to support their conclusions. It is all assumption, developed by analogy from the study of the lower organisms, especially the insects and kindred orders, and applied to collective and individual human behavior because of the great vogue which

biology attained among us in the latter part of the nineteenth century. There are fashions and fads in science as well as elsewhere. Perhaps those who feared the advancing influence of what they were pleased to call "materialism," also had a hand in this overemphasis of heredity. They would have nothing of "economic" or "materialistic determinism." Those were terms which in their minds were often confused with "infidelity." So, in order to escape from these demons they willingly became enslaved to a more ruthless one still, that of biological determinism. What could be more hopeless than to have all of your behavior predetermined by the content of the germ cells of the ape, the reptile, fish, and what not, back to the beginning of things living? And what irony for those anti-evolutionists who are also enthusiastic instinctivists, as I suspect most of them are.

As a consequence of these historical forces at work, the term environment has been until recently in considerable disrepute, especially among those with biological preconceptions. And yet under the term "nature" we have long since recognized the marvellous intricacy and preeminent power of environment. We have been awed and terrified by its tremendous influence in the form of cataclysms. Tornadoes. hurricanes, typhoons, floods, droughts, leave man weak and helpless. Epidemics and plagues he is beginning to control, though this control is as yet precarious and incomplete. In the realm of the social environments, the influence of invention, domesticated animals, cultivated plants, tradition, custom, and institutions, has been realized for centuries. But when the scientific term environment is substituted for the metaphysical term "nature," and when invention, domestication, customs, traditions, institutions, etc., are scheduled as environment, objections are likely still to be raised. From a scientific (and anthropocentric) point of view, all phenomena must fall under the categories of man

and the environments, although from a metaphysical and theological point of view, other factors may be admitted. In some of the past writings on the subject there have been intimations that environment is a vague, passive something, different from nature or social process. This loose and unstandardized usage of the word has led to a great deal of misunderstanding in social science. This vagueness and uncertainty attaching to the term environment must be removed by extended analysis and classification. The social scientists see this clearly and many people are now at work on the problem. Several studies emphasizing this point of view by men like Thomas, Reuter, McKenzie, among others, have already appeared, and others are on the way toward completion. If I am not mistaken, the next ten or fifteen years will witness a complete reorientation of the social and mental sciences and of their application to the problem of social adjustment, as a result of these studies in the social environments. I do not mean that inheritance will not always be recognized as an important factor in the organization and control, even of human behavior and social activities. But man's and nature's joint creations, the social environments as outlined so briefly above, are becoming ever more and more dominant over collective and individual behavior. Tomorrow. in the social sciences, belongs to the student of environment, just as the past fifty years belonged to the student of inheritance

I have not time in this crowded paper to develop in detail what seems to me will be the result of this change of emphasis to environmental factors in the organization of individual and collective behavior. I have attempted to state the method and significance of environmental processes more fully elsewhere. But in a word I would say that it appears to me that this new emphasis in investigation will mark the rise of social psychology and the social

sciences generally to the status of true sciences alongside of psychology and biology. Economics, sociology, history and political science have already based their investigations primarily upon the assumption of environmental factors, which they have not adequately analyzed. Yet some of the best characterizations of the influence of environment upon the economic institutional organization of society have been made by such economists as Adam Smith, J. S. Mill, and Pigou. Seligman has attempted to classify the physical and biological environments of man. But few of the economists and sociologists have begun to see adequately the importance of custom, traditions, mores and institutions, although no other concept is of more importance to the new economics and the historian of culture. To the sociologist it is indispensable. Perhaps history and political science have suffered most from the gratuitous assumption of hereditary race traits and metaphysical trends and capacities unrelated to environmental conditions and causes. Recently economics in its worthy attempt to utilize the results of psychological investigations in its interpretation of the market and of production, has approached mainly through the wrong door and has entered the instinctivist blind alley; but it will soon find itself. Every science has always been primarily an attempt to analyze and organize some aspect of the environment of man.

The eighteenth century gave us the exact sciences of physics and chemistry, and the nineteenth century perfected their technique and made them usable tools for the creation of a new physico-social environment for man, through the invention of machinery and the creation of synthetic compounds and the extraction and transformation of the wealth of nature. The nineteenth century gave us biology and psychology as true sciences, and the early twentieth century is perfecting their techniques as usable tools for the service of man through a newly created bio-

social environment. The twentieth century is developing the technique of the environmentally based social psychology and social sciences and will add these to the agents serving mankind intelligently, for it will be the function of the one to create an effectively planned psycho-social environment and of the others to administer it and to determine the limits and character and functioning of all social or derivative environments on which man is dependent for his productive materials and personality development.

Perhaps some of you would feel that my paper would have been more in place at a meeting of psychologists, and others that after all it is an exercise in philosophic hairsplitting. So excellent an authority as Professor Knight Dunlap thinks it useless to attempt to distinguish between instinct and habit. But on the other hand, perhaps even more excellent authorities, Professors Dewey and C. J. Herrick, the neurologist, believe that such a distinction, made accurately and persisted in relentlessly, lies at the foundation of all constructive work in the social and educational sciences and practice. The social sciences must no longer be content with mere description. Description of the phenomena with which they deal is a valuable work to be done and must always have its devotees. But the social sciences have now arrived at the stage of development at which they must serve definite advisory functions in the construction of social policies. They must delve to the causes of things economic, political and social. They must learn to foresee the consequences of legislation and other forms of collective behavior. The problem of human nature-of whether it was predetermined for man in past geologic ages or whether it can be in large measure reconstructed in each new age, if we only know what environmental forces to put in operation—is at the very heart of the matter of the public service of the social sciences. I wonder if much of the quarrel which the anti-evolutionists

have with modern psychology and social science is not a dumb brooding and dimly understood fear on the part of these keepers of the public conscience that somehow the psychoanalysts, sociologists and other "new thought" ilk are trying to put over on their generation the morals and ideals (or the lack of both of these) of the dinosaurian ages under the banner of a new-fangled scientific terminology. If such is the case, we can relieve them of their fears at once.

Yet the environmentalist theory does not go to the opposite extreme of the instinctivist theory and hold that the social scientists may fashion any sort of world they please. Death will still menace us; the inhabitable portions of the earth cannot be expanded at will; micro-organisms will continue to be invisible, although the microscope and other extensions of our senses may locate them; human effort and human intelligence will always have limitations of some sort, and the glorious unlimited perfectibility of man, which was the dream of the eighteenth century philosophers, will never be more than a dream. Something can be done through breeding to make men better men-physically and mentally—but the chief avenue to social improvement, within the limitations of possibility, lies through the control of environment. To create new resources of intelligence and character is difficult, although not so difficult as the creation of new natural resources. But the better utilization of those human and social resources we have should be a much easier task when we learn better how to utilize the social sciences constructively.

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# THE FIRST PRINCIPLE OF SOCIAL EVOLUTION

I T IS a commonplace that social changes often take place independently of human foresight or volition. Such changes, and the focusing of attention upon those that have happened to be progressive, are responsible in part for the social optimism revealed in such expressions as "God in history," "a power outside ourselves that makes for right-eousness," "manifest destiny," and the like. Such optimism is derived from "counting the hits and disregarding the misses". To the fact of unwilled social changes may be ascribed also the social pessimism that regards man as powerless to control social events and determine social destiny, and the study of society with any hope of influencing social evolution as futile and visionary.

But the fact that "the world moves," sometimes in the right, sometimes in the wrong, direction should awaken curiosity as to what makes it move of itself, and the belief that a knowledge of how social changes take place might lead, as in other realms of phenomena, to the power to control them.

Now, a knowledge of how any movement takes place reveals a principle. Natural principles are the modi operandi of nature in producing change. When social changes occur that are unwilled by man, natural social principles are involved. A knowledge of these principles is the first step to the conscious control of social destiny. A knowledge of principles is power.

The principles of social change are many. Some of them have been discovered; many more will doubtless be revealed by further social investigation. Some are of limited application; they operate only in the natural movements of society; they are strictly social principles. Others operate throughout the entire realm of mental phenomena —they are psychological. Still others extend into every department of the biological world. A few are of universal application—they are cosmical. It is the purpose here to point out the most fundamental of these general principles, and to show how it operates, and how it may be utilized in the conscious control of social evolution. Treatment in so brief a space must necessarily be general. We shall begin with a glance at evolution in the inorganic world, since it is there in this simplest form of evolution that we may expect to find this principle most clearly displayed.

## THE EVOLUTION OF THE ELEMENTS

The chemical elements are the different kinds of material particles, long supposed to be irreducible or indivisible, of which our material universe is composed. Some eighty of these elements have been discovered and named, —as oxygen, hydrogen, carbon, nitrogen, etc., etc. Theoretically, there are ninety-two. Our material universe is built up, that is to say, wholly constructed, of ninety-two different kinds of building blocks, and no more.

It has recently been ascertained that these so-called elements or atoms are not indivisible, that each one of them is a cluster of electrons revolving about a central hydrogen nucleus, or nuclei with other revolving electrons. This nucleus is called a proton. It is furthermore believed that electrons are identical in their makeup, and that all the elements are constituted of different numbers and arrangements of these identical units. There is, then, only one single primordial unit or element of which the universe is composed. Qualitative differences in the different chem-

ical elements are thus reduced to quantative differences, since they depend upon the number and orbits of the revolving electrons, and upon the number of hydrogen nuclei in the center of the atom. All chemical elements, then, are essentially the same. Here is a unity in diversity which has long been dreamed of, but which has only recently been discovered. It is literally true that all nature is one. But the fundamental unity of nature is not the only nor, from our present viewpoint, the most significant truth that emerges from the discovery of the nature of the atom. Atoms are merely combinations of electrons. and each atom manifests its own peculiar properties. Among these is that of uniting, under certain conditions and for reasons not thoroughly understood, into molecules. Each molecule, like each atom, manifests its own peculiar properties, and unites with others of its kind to form masses. The significant fact to observe is that each new combination manifests a wholly new set of properties. Given a practical infinity of single original and identical elements, new objects with new properties, that is, new creations, arise simply from new collocations of these original components. Each separate chemical element with its differential properties is simply a different system of electrons and protons; one system manifesting itself as oxygen, another as carbon, another as nitrogen, etc.; in one case a gas, in another a liquid and in still another a solid. All the chemical elements and hence all material substances, since they are composed of these elements, are merely combinations in different forms of the same primordial world stuff. So far as the inorganic world is concerned, given this world stuff, we know exactly how it is created. It is a process of combining similar units. Exactly the same things put together in different ways and proportions manifest themselves as the different elements. These so-called elements, and molecules as well, sometimes

enter into new combinations apparently without breaking up into their original units. There is thus compounding and recompounding. The law of recompounding or aggregation, says Ward, "consists simply in the assumption that in the formation of the more complex substances out of the more simple, the molecules of the lower orders enter bodily and as units into the constitution of those higher ones. That is, they are not, or at least not necessarily, first decomposed into their simpler elements and afterward combined to form the higher unit, but the units of the next lower order become the elements composing the molecules of the next higher." The result of this process of recompounding is the formation of the various substances, and these substances manifest properties entirely different from those of their constituent elements. Thus, to take the most familiar example, hydrogen and oxygen, two gases, unite in the proportion of two atoms of hydrogen to one of oxygen into a new substance, water, with properties entirely unlike those of either of its constituent elements. Iron and sulphur combine to form iron sulphide which is just as unlike iron or sulphur as water is unlike the elements of which it is composed. Ammonia gas and hydrochloric acid unite to form ammonia chloride, commonly known as sal-ammoniac. Sodium and chlorine unite to form salt. It appears then, that in the whole inorganic world the only principle necessary to account for its infinite variety and its development is the principle of combination or compounding, and recompounding.

That this mode of accounting for the inorganic world is correct is confirmed by the well-known phenomena of isomerism, that is, of wholly different substances consisting of exactly the same elements united in the same proportions and with identical molecular weights. It is a well-known fact that there are many different substances which upon

<sup>&</sup>lt;sup>1</sup>Glimpses of the Cosmos, vol. 5, p. 88.

the most careful chemical analysis reveal the same elements and none others. The chemical formula for sugar, for instance, is exactly the same as that for acetic acid. Carbon, hydrogen, oxygen, and nitrogen combined may produce a poison or a tonic, an explosive or a food, a medicine or an aroma. There is only one way to account for this curious fact. The differences manifested by these highly different substances may be explained only on the ground of a difference in the arrangement and the groupings of the constituent elements. The principle involved is the same in this case as in the others, namely, the principle of combination. Says Gibson, "we see some atoms giving up one or more detachable electrons which are accepted by other atoms, producing a disturbance in their electric balance, and causing the atoms to attract one another and become chemically united. In this way we account for the production of all the variety of compound substances known."2 The principle of compounding, then, is fundamental in the natural changes or evolution that takes place in the inanimate world. We are now to see whether this principle may be traced upward through the phenomena of life, mind and society.

### THE ORIGIN OF LIFE

Thus far we have considered only the inorganic world. Now, it was long thought that organic compounds could only be produced through the operation of a new principle, that is, the principle of life, the so-called "vital principle." But in 1828 Wohler, a German chemist, constructed in the laboratory for the first time an organic product (urea). It has exactly the same formula as ammonium cyanate. All that was necessary to change the inorganic into an organic substance was to dissolve it in water and add a little heat; nothing new was required. Since 1828 the number

<sup>&</sup>lt;sup>2</sup>Scientific Ideas of To-day, p. 328.

of organic products artificially created has mounted to something like 150,000. They are easier to create than many of the inorganic compounds. And many of these compounds, both organic and inorganic, created in the laboratory are entirely new creations; they exist nowhere in nature. The chemist has actually become creator. Having discovered that the principle of creation in the chemical world is the principle of compounding, he is now able to create new substances through the utilization of this principle. Knowing the principle he is able to determine the product.

As yet the chemist has not succeeded in creating a compound manifesting all the properties of life. He may never be able to do so. But it seems reasonable to think that if the problem should ever be solved, it will be solved through the control of the same principle that operates in the realm of material things, that is, the principle of compounding. "According to the best knowledge of modern scientists, life (animate existence as differentiated from inanimate existence) began when for once all physical and chemical elements were present in the ideal proportion necessary for the creation of the first living cell." This is perhaps the general belief of scientists. The physical basis of life is protoplasm, and protoplasm is a substance the molecules of which are very complex. It is a mixture in large part of various nucleo-proteids, substances which in their molecular structure and chemical composition are the most complex bodies known. A molecule of protoplasm may contain thousands of atoms. Consequently, its chemical formula is difficult to determine. No wonder its properties are surprising. But when the formula is determined. if it ever is, when the chemist is able completely to analyze it, he will reproduce it, for it is the present claim of the chemist that he can constitute whatever he is able to analyze.

Be this as it may, we know that a molecule of protoplasm manifests a wholly new set of properties, and among these properties are motility, irritability or sensitivity, and metabolism, the primary qualities of living things. It is altogether reasonable, then, to suppose that the same principle theretofore at work in nature presided at the origin of life, and continues its operations into and through the field of living things; that the principle of compounding accounts substantially for the existence and evolution of organic and living substances just as it explains the appearances of the manifold substances of the inorganic world. Can we follow it further?

#### THE ORIGIN OF MIND

The next great step in the orderly process of evolution was the creation of mind. Mind, it is generally admitted, is primarily a function of the brain, and particularly of the gray matter, the cortex, a thin layer of highly organized matter enveloping the white matter of the cerebral hemispheres. It is complex almost beyond imagination, and this complexity is of the elements present in it, among which there is to be found absolutely nothing with which we are not already acquainted in the lower realms of matter. Mind, then, like life appears in conjunction with especially organized matter constituted wholly by the compounding, recompounding and organization of the original units out of which all material things are composed. That is to say, both mind and life are peculiar properties of matter especially compounded. In their creation and development, there apparently is nothing new save the new arrangements entering into the constitution of living matter including the gray matter of the brain. They are the products of combination and organization, that is, of compounding.

This is not to say that science will ever reach any final

explanation of life or mind. Indeed, it is not likely ever to reach an explanation of the properties of any combination of the original material elements. We know no more about why it is that, for instance, sodium and chlorine in combination produce the peculiar qualities of salt than we know why certain peculiar combinations of the elements produce organic phenomena, and in higher and more complex organization produce consciousness and mind. Science finds no final explanation of anything. At bottom all is miracle, or perhaps we should say unknowable, for the human mind is finite.

Mind, then, so far as we are able to see, is a manifestation of a peculiar and highly complex aggregation and organization of molecules, which in turn are combinations of atoms, which again in their turn are peculiar combinations of electrons. Mind is the result of a recompounding and organization of molecules which are themselves the products of the compounded electrons. Compounding, again, is the ultimate principle involved, at least the ultimate so far as our knowledge can penetrate.

## THE BEGINNING OF SOCIAL GROUPS

Finally, in the orderly process of evolution from electrons to atoms, atoms to molecules, molecules to organisms, and to mind, we have combinations of organisms into groups. These groups appear, of course, among the lower animals as well as among human beings. Human groups were probably at first families, but, whatever they were, it is an admitted fact that early in human history nature had produced through the combination of individuals innumerable small heterogeneous groups. These groups are the social atoms. They came into contact, and there happened just what happened among the chemical elements, namely, new properties appeared, in this case new social properties. Gumplowicz assumes that the simplest and the original

social elements were primitive hordes. But whatever they were, there must have been a great number of them in remote antiquity. Now, "as soon as one group is exposed to the influence of another", he says, "the interplay of mutual forces ensues inevitably and the social process begins. When two distinct (heterogen) groups come together, the natural tendency of each is to exploit the other, to use the most general expression. This, indeed, is what gives the first impulse to social process."

Is it not apparent that we have here a process exactly parallel to, or continuous with, what we have already seen to be true in the chemical, organic and psychic worlds? The social process, like all the lower evolutionary processes. is primarily a process of compounding. Only in the case of social evolution it is the compounding of social groups instead of chemical elements and molecules. Gumplowicz assumes that the natural tendency of each social group to exploit the other was the original generating factor in the social process, and this is probably true. There was not much intelligence in early times. Consequently men erroneously concluded that exploitation is the most effective method of the acquisition of property. Hence the first effect of the early contact of social groups was a display of hostility. To a student of primitive society it appears plain that war was originally the principal generator of the social process, and he is likely to conclude, as do Gumplowicz and many others, that it must always be necessary to that purpose. "War", said Heraclitus, "is the father of all things," and this is perpetually repeated. But it is not true. It is not war that is the father of all things, but compounding; in the case of society, the compounding of social groups. And this may be, and often is, effected by peaceful means. The mistake on the part of the glorifiers of war, and of those who claim it is a necessity though they profess to de-

<sup>&</sup>lt;sup>3</sup>The Outlines of Sociology, p. 85.

plore it, is that they identify a mode of combination with the true cause of the social process. War appears to be the causal factor of social evolution merely because it was a conspicuous form of social contact in primitive times.

That it can be regarded as a factor now is the most serious reflection upon the intelligence of the race. "Give me the money that has been spent in war," said an early writer, "and I will purchase every foot of land upon the globe. I will clothe every man, woman and child in attire of which kings and queens would be proud. I will build a school house on every hillside, and in every valley over the whole earth: I will build an academy in every town and endow it; a college in every state, and fill it with able professors; I will crown every hill with a place of worship, consecrated to the promulgation of the Gospel of peace; I will support in every pulpit an able teacher of righteousness, so that on every Sabbath morning the chime on one hill should answer to the chime on another round the earth's wide circumference; and the voice of prayer, and the song of praise, should ascend like an universal holocaust to heaven." This is not mere rhetoric. War is the superlative and most conspicuous example of social waste, and to say that mankind cannot eliminate social waste is to deny the possibility of collective intelligence. War has been the father of some things, some good, some evil, but it is not the father of all things. It is merely a mode, and only one mode, of bringing about the combination and recompounding of social groups which in the long course of social evolution manifest themselves in an ascending order of families, clans, tribes, cities. states, nations; each manifesting new and peculiar properties exactly as do new combinations and organizations of chemical elements and molecules in the inorganic and the organic worlds. A true principle and the basic principle of social evolution, as indeed of all evolution, is the principle of compounding.

It is not surprising, then, that civilization first appeared in Mesopotamia, Egypt, Crete, and in the Central American funnel through which the various peoples of North America poured on their way to the south. A slight consideration of the geography of the old world and the new, and of probable early migrations, will show that the early civilizations arose in just those particular localities in which social groups were forced into contact by natural causes, and a favorable physical environment induced them to remain together and combine. The narrow and fertile valley of the Nile, for instance, was the retort into which heterogeneous social groups were forced by natural circumstances and more or less fortuitously fused into a higher social combination.

We have now seen that nature, apart from the conscious purpose of man, is in all realms truly creative; that the products of nature in the order of their appearance are electrons, chemical elements, inorganic substances, molecules, protoplasm, organisms, mind, society; that compounding is a universal principle. Nature creates; it also destroys. But in the long run it has manifested a continuous evolutionary process that has been called "creative synthesis," or synergy. What I wish to emphasize is that this natural process of synergy, plainly manifested in the world before man, continues in and through human society, and reveals to us the basic principle of social evolution,—the basic but not, of course, the only one.

## SOCIAL EVOLUTION MAY BE CONSCIOUSLY PRODUCED

In all that I have thus far said there is nothing particularly new. That nature is creative is the thesis of Bergson in his *l'Evolution Créatrice*, and it is the fundamental idea of Lloyd Morgan's *Emergent Evolution*. It was earlier and much more clearly enunciated by Lester F. Ward. "I borrow this expression (creative synthesis)", says Ward,

"from Wundt, who gives the central idea of it in the following passage: 'There is absolutely no form which in the meaning and value of its content is not something more than the mere sum of its factors or than the mere resultant of its components.' But I shall make of it a still wider application than he does . . . . it is a composite idea. The notion embodied in the second component is nothing more nor less than the fertile truth taught most clearly by chemistry that a compound of two substances is something more than the sum of those substances, and is in a proper sense a third and different substance. That its properties are in some way derived from and due to those of its components is not denied, but the relation is one that no human insight can fully comprehend. No one, for example, could predict in advance what kind of a substance would result from even so simple a combination as oxygen and hydrogen in the proportion of two atoms of the former to one of the latter. No one could have told till he had tried it whether the resulting substance would be a gas, like both the components, or a liquid, as it is at the ordinary temperatures. or a solid, as it is at lower temperatures. Much less could any one have told what its properties would be."4

What we have particularly in mind here, however, is not merely to point out that the fundamental principle of evolution, of all evolution and hence necessarily of social evolution, is the principle of compounding, but also to insist that this principle, utilized in chemistry, and in fact in all the lower realms of human effort, may also be employed or applied in the realm of human society, and the future development of society be to some extent thus directed. The knowledge of how nature brings about evolution, no

<sup>&</sup>lt;sup>4</sup>Pure Sociology, pp. 78-80. The idea was clearly expounded long before this book or either of the others mentioned was published. See Ward's papers on The Status of the Mind Problem, originally published in 1893, Glimpses of the Cosmos, vol. 5, pp. 80-98, and "The Natural Storage of Energy," The Monist, Jan. 1895, pp. 247-263.

matter what kind, should enable man to bring it about himself if he has the power to control the elements which come into combination. This man can do and does in the subhuman realm. He may also increasingly determine the kind of social combinations that are formed in the future, and thus the kind of social properties that will be manifested in new social groups and new forms of culture. Man may thus be in a very real sense the architect of his own fortune, the determiner of his own destiny.

Now it is perfectly easy to see that if the compounding of social groups results in the manifestation of new social properties, that is, in social evolution, this essential condition of social progress may be secured in many ways, of which war is only one, and a most uneconomical one. Such combinations may be secured by federations, treaties, leagues, etc., as well as by war, and with much less expenditure of means and energy. Bring the social atoms and molecules together, and a social process begins. What the outcome will be we shall not predict. But change, that is to say, evolution (not necessarily progress) will result. The social units, like the chemical, will combine. For there is social as well as chemical affinity. We can produce social evolution. Let us now see whether we can control it.

### THE DIRECTION OF SOCIAL EVOLUTION

In primitive times social combinations, and social evolution, could be achieved only by immediate contact and intermixture of the populations of social groups. Modes of contact through distant communication were practically non-existent, compounding necessarily involved physical and biological contiguity. Today, however, we have arrived at a stage in the development of the means of communication at which the combination or compounding of social groups may not necessarily be thought of as physical

interpenetration of populations. That is not the essential thing. The essential thing is the contact and combination of ideas and cultures. This may easily be secured in this age without the physical intermingling of one group with another. It may result, and does result, from the conquest and subjugation of one group by another. It may take

place also peacefully and at a distance.

The heart of a civilization is the ideas it embodies. All that is necessary to effect a combination of cultures is to bring the ideas of the groups together. This is done today, more or less unconsciously, through the employment without a definite social purpose of the various means of communication, and evolution is taking place. But this evolution should be controlled. And how? By the determination of the ideas that are to enter into the new synthesis. This does not imply that we may or can select out the particular ideas that we wish to unite. What, then, should be the elements of the new compounding?

Well, we are generally agreed that the truth is always salutary. The ideas that should enter into new social combinations, then, should be true ideas. True ideas, we believe, are derived by careful, impartial investigation of the world in which we live, that is, by science. Bring together the true scientific ideas of the world and, though we may not be able to predict the exact result, we may safely rely on the outcome.

## CONCLUSION

In organic and inorganic evolution, then, the basis of progress is the compounding, recompounding and organization of atoms and molecules; in social evolution, the units of combination are ideas.

Future society will depend upon the character and number of ideas that unite in future combinations. These are conceivably within human control. To say that man cannot control future evolution is to declare that he has no control of the formation of ideas and their dissemination, and this, I suppose, no one would like to admit.

Two things, then, are fundamentally necessary in the successful control of social evolution. In the first place, the process of the formation of new ideas to enter into combination with other ideas must not be interfered with; and, in the second place, there must be free opportunity for these ideas to mingle and combine. The diffusion of knowledge by means of travel, formal instruction, exchange of books, magazines, etc., is by far the most economical means of bringing ideas together. War, I repeat, is wholly unnecessary. The most effective "broadsides" are those of ideas. The origination and diffusion of ideas, then, is the principle and necessary condition of social evolution

But if social progress is to be achieved in any other than a haphazard manner, that is, in the manner of nature, through the compounding of ideas, it is obvious that the combination of truly progressive ideas is the consummation to be wished. Now, progressive ideas are determined by the careful investigation of the phenomena of nature. This is the sole source of truth. Those who declare that action or experience is also a source of truth merely mean that in action and experience ideas and truths are tested or interpreted.

It follows, then, plainly enough that there should be throughout the world a perfectly free flow of scientific ideas, and everywhere the most earnest and intelligent encouragement of scientific investigation. The greatest detriment to progress, the real "sin against the Holy Ghost", is opposition to science and to the diffusion of scientific ideas in human society, both horizontally and perpendicularly. Opposition to teaching the young the scientific ideas derived from the painstaking investigation of nature,

and to the early use of the mind in exercise upon these truths, is infidelity to the divine purpose of directing the evolution of society to higher and higher levels.

This means, of course, a universal education—an education which really involves the diffusion of scientific knowledge and the operation of the fundamental principle of social evolution, namely, the compounding, recompounding and organization of ideas, and the application of this principle in an intelligent effort to direct the future evolution of society. Other principles may and should be applied, but this one is fundamental.

"Let knowledge grow from more to more,
But more of reverence in us dwell,
That mind and soul according well
May make one music as before, but vaster."

I. W. HOWERTH

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# THE NOTION OF INTELLIGIBILITY IN SCIENTIFIC THOUGHT<sup>1</sup>

I

THERE has been a remarkable change of attitude in recent discussions on the meaning of scientific thought. Interest is no longer centered upon the rôle and nature of particular conceptions in isolation, nor even on the general character of conceptions as such. What is rather being attempted is inquiry into the broad structure of scientific thought as a whole, viewed in relation to the intellectual and emotional background in which it arises in the life of man.

It is probable that one underlying cause of this change is the orientation of modern physics in the direction of abstract and comprehensive theories. Such developments direct attention to groups of theories rather than to particular conceptions; and as they usually involve the sacrifice of some assumptions, or their reduction to dependence on others, they tend to throw into relief the relation between bodies of theory and their underlying assumptions. In short, philosophers of science, too, have been encouraged to generalize their results. The familiar critical accounts of the place of hypotheses in the scientific process are giving place to attempts at rendering more explicit the fundamental and often unconsciously held generalizations which lie behind our very "ideals of explanation" themselves, and mould the form of scientific theory.

<sup>&</sup>lt;sup>1</sup>A paper read at the Sixth International Congress of Philosophy held in Cambridge, Mass., September, 1926.

Many modern writers illustrate this tendency; but I must content myself here with a bare reference to the work of Emile Myerson and A. N. Whitehead. The latter has stated, in his remarkable Lowell Lectures, the general standpoint of those who undertake such studies. He points out that when you are criticising the philosophy of an epoch (and the same is true of its science) you must not chiefly direct your attention to those intellectual positions which its exponents feel it necessary to defend. "There will", he says, "be some fundamental assumptions which adherents of all the variant systems within the epoch unconsciously presuppose. Such assumptions appear so obvious that people do not know what they are assuming because no other way of putting things has ever occurred to them."2 The importance of this to the student of the philosophy of science has recently been stressed by Prof. Leonard J. Russell, who has traced in detail the influence of those wide preliminary generalizations which guide and condition investigation without being in any formal sense the natural outcome of the facts themselves. It has long been recognized that in narrower fields of scientific work, there is often, in Galileo's apt phrase, "a rape of reason upon the senses." But what Russell has specially in mind is the more pervasive and unobtrusive background of guiding ideas which are "so wide in their scope, so general in their nature, so tenaciously held in the face of contrary evidence, that they seem to express something in man's attitude to the facts rather than to express the mere facts themselves."3 To those anticipatory but challenging generalizations he gives the names of "demands". Some of these demands are logical, as that for consistency; some aesthetic, such as the demand for simplicity. But the one with which we are concerned in this

<sup>&</sup>lt;sup>2</sup>A. N. Whitehead, Science and the Modern World, 1926, p. 71.

<sup>3</sup>L. J. Russell, "Science and Philosophy", Proceedings of the Aristotelian Society, N. S., Vol. XXV, 1924-1925, p. 66.

paper is the demand that nature should be intelligible.

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It is obvious that this demand for intelligibility is involved very early in the history of science: as soon, in fact, as we pass from the observation of particular events and attempt to group them into systematic order by means of hypotheses, however vaguely these may be expressed. "With the construction of theories science enters on a new plane in its development, and serves a different set of human values. Its facts, the product of local curiosities, now take an order, and serve the desire for comprehension. . . . The desire for knowledge becomes transferred into the desire for significant knowledge—significant primarily for contemplation and secondarily for practice."4 This desire for compensation would clearly be doomed to frustration if the world were not intelligible. thought is therefore built on "the inexpugnable belief that every detailed occurrence can be correlated with its antecedents in a perfectly definite manner exemplifying general principles." These are the words of Prof. Whitehead who insists further that, but for this belief, the incredible labours of scientists would be without hope. "It is this instinctive conviction", he says, "vividly poised before the imagination, which is the motive power of research: that there is a secret, a secret which can be unveiled." The final phrase is important. The notion of intelligibility implies not only that there is a secret, but also that it can ultimately be revealed. The idea of an "order of nature" must be very old: its origins are lost in the dim beginnings of man's rational awakening. But it has not always been further supposed that such an order can be attained by reasoned steps. Santayana has pointed out, for instance, that Goethe's Faust is based on the as-

<sup>4</sup>J. W. N. Sullivan, Aspects of Science, 1923, p. 11.

<sup>&</sup>lt;sup>5</sup>A. N. Whitehead, loc. cit., p. 17.

sumption that nature is fundamentally inscrutable. is not all open to eventual inspection; she is no mere mechanism of minute parts and statable laws. Our last view of her, like our first glimpse, must be interpreted; from the sum of her manifestations we must divine her soul. Therefore only a practical and rhetorical art, like magic, has any chance of unveiling her, and of bringing us face to face with the truth." Hence Faust turned from the sciences to magic, just as others in our day turn to different arts as the prime revealers of nature's basic essence. Science, on this view, does not so much reveal the order of nature as bestow one upon her. Experience, to quote Santayana again, is turned into "so many reviewed events, the passage of so much substance through many forms." This phrasing has a familiar ring. It is reminiscent of Myerson's view that the development of science rests on a deep-rooted conviction of the human reason that a rational explanation of phenomena has been reached when apparent differences have been reduced to a real identity. Or again, we are reminded of Eddington's conclusion from the reduction of many of the laws of physical science to identification of substance: namely, that man filters out matter (and presumably other forms of substance) from the meaningless jumble of qualities "as the prism filters out the colours of the rainbows from the chaotic pulsations of white light."

Two separate questions are clearly involved, then, in the scientist's belief in the intelligibility of nature. He assumes, first, that there is a consistent inter-relatedness of its parts; that there is, in fact, a structure: and, secondly, that science is competent to reveal that structure without distortion. It will be convenient to deal with those two aspects of our problem.

<sup>&</sup>lt;sup>6</sup>G. Santayana, Three Philosophical Poets, 1922, p. 154.
<sup>7</sup>A. S. Eddington, Space, Time and Gravitation, 1920, p. 198.

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The first aspect was stressed by Prof. T. P. Nunn in his book The Aim and Achievements of Scientific Method, published in 1907. For him, science is one of several possible alternative processes by means of which what he calls "primary facts" are rendered intelligible. And he explains that when he says a thing is intelligible he means that it "forms an element in a system of terms in relation."s What distinguishes the scientific process from other modes of rendering the objective intelligible is, according to him, the presence of no motive except the desire to render it intelligible. In short, the process is disinterested, or, in the words of Mr. Bertrand Russell, "ethically neutral." The assumption throughout is, however, that there is a structure which the process reveals. Broad puts this assumption in other words when he says that the proposition that the world is intelligible involves, amongst other things, the proposition that the world obeys the laws of logic.9 He adds that this is all the pure mathematician requires, but that it is not sufficient for the natural scientist. Consideration of the further postulates involved in the notion of intelligibility as used in the natural sciences brings us at once to the second aspect of our problem.

We have stated this second "demand" implied in the notion of intelligibility as the belief that science is competent (a) to reveal the structure of nature, and (b) to do so without distortion. Now (a) is clearly a more fundamental requirement than (b): for the conditions necessary to attempts at discovery of the order of nature must be satisfied antecedently to any hope of successful discovery. Moreover, those preliminary conditions might exist without our being able to make use of them to reveal the truth without "distortion". In (b) is involved the whole ques-

<sup>&</sup>lt;sup>8</sup>T. P. Nunn, loc. cit., 1907, p. 47.

<sup>°</sup>C. D. Broad, The Mind and its Place in Nature, 1925, p. 507.

tion of the objectivity of science. I have elsewhere put forward reasons for believing that the order of nature revealed in the sciences is objective, in spite of the all-pervading selectiveness of scientific work. I shall not, therefore, pursue this further here, but shall turn to the problems involved in (a): namely, what are the conditions without which all the attempts of natural scientists to discover the order of nature would be foredoomed to failure.

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Broad has stated in his Mind and its Place in Nature, 11 three further necessary postulates. It would probably be possible to analyse out others; but I shall confine myself to the consideration of these three.

The first is that the laws of nature must be neither too numerous nor too complex. This postulate is clearly related to the aesthetic demand for simplicity. It is true that this seems at first sight to lead us perilously near to the kind of argument used for retaining the circular path of the planets: namely, that the circle is the perfect figure. Indeed, men of science have sometimes put the case in a form which is no less objectionable for being less obvious as when Schuster remarked that "the strongest of our scientific instincts is our belief in the simplicity of nature." We must not assume simplicity; though we must recognize that, if natural laws were too complicated, their discovery would be impracticable. There is no inconsistency in accepting Fresnel's famous saying that there is no a priori reason to suppose that Nature takes any account of analytical difficulties; and, at the same time, making full use of such working principles as Mach's Principle of Economy and Occam's razor whose objective effectiveness depend on the truth of this first postulate. Explicit recognition of the need for this character of simplicity in natural laws, if

<sup>&</sup>lt;sup>10</sup>A. E. Heath, "Objectivity in Science," Proceedings of the Aristotelian Society, N. S., Vol. XXVI, 1925-26, pp. 211-224.
<sup>11</sup>C. D. Broad, loc. cit., p. 507.

such are to be discoverable, has an important consequence. It enables us to envisage the possibility that science may only emerge in certain restricted regions of space. Eddington has described the astounding chaos, the hurly-burly of fragmentary electrons and protons, in the high temperature interior of a star. He has insisted that these chaotic conditions must not be regarded as abnormal: on the contrary, it is the normal condition (in the statistical sense) of the greater part of the material universe. Our special conditions on this planet, which must seem like the still orderliness of death in relation to the normal chaos, may be the only ones where natural laws are simple enough for intelligible description.

The second postulate required by natural science is that it must be possible to isolate one phenomenon from all the rest, at least to one degree of approximation. The importance of this is that if this character of nature were absent, all forms of abstraction, and in consequence all forms of science, would be impossible. The part played, and played increasingly, in the sciences by abstraction has never been so fully understood as in our own day: and we owe the first advances in these studies since Greek thought to the genius of Prof. Whitehead. I can add nothing to his account. But here, as with the first postulate, explicit recognition throws light on the limits of science. For the final and characteristic result of scientific investigation based on abstraction is the production of equations. But there may be what Clerk Maxwell called "singular points" where the equations break down. Such singular points are where influences which are usually (to some degree of approximation) negligible assume a dominating importance. If there were many singular points our sciences would become chaotic. It does not follow that such disharmonies might not ultimately be resolved. Indeed, as Maxwell recognized, singular points are sometimes points of growth. They may be the rough edges of the building, showing where the next construction is to be. Whether it is to be growth or failure, however, can only be empirically determined: but it needed the humble-mindedness of Maxwell to see in the optimistic 19th century, the theoretical importance of these signs of possible limits to scientific advance.

The third of the series of postulates is that our sensations must come to us in such an order as to reveal the laws really present. The possibility of other orders in our sensations has best been brought out, I think, in Mr. Norman Campbell's book, *Physics: The Elements*, where he makes it clear how great a part in the setting in fruitful order of our sensory observations is played by comparison with other observers. I shall not develop this postulate further, but refer only to one point: namely, that the need for this postulate discloses the possibility that just as there may be chaotic regions in space, so also there may be regions in time where science is impossible.

5

I will conclude this brief sketch of what is implied in the notion of intelligibility in scientific thought by referring back to what was said at the beginning about the tendency towards more generalized forms of scientific philosophising.

Modern science is taking more and more abstract forms. For full grasp of its vast operations one must stand away from the process and view it as a whole. Further, as addition is made to the superstructure of science, it is increasingly necessary to pay attention to the foundations on which it rests. That is why our philosophising on science must, within the limits of our powers, be made both wider and deeper.

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## KANTIAN RELATIVITY

HILE it is an oft repeated statement that Kant effected a "Copernican revolution", or thought that he had done so, there is a rather general confusion as to why he called it "Copernican". In fact, the criticism is sometimes made that, in its anthropocentricism, it is Ptolemaic rather than Copernican. Norman Kemp Smith<sup>3</sup> has shown that Kant's analogy is well chosen and accurate. Copernicus explained the apparently objective movements of the planets and the sun as projections, with reference to the frame of the fixed stars, of our own motion. The extension of this principle of explanation to a vastly wider field of knowledge constitutes Kant's "Copernican revolution", and amounts to a very general theory of relativity. The study of this relativity in the field of space, time, and motion is the object of the following discussion. The close relation which Kantian relativity bears to the Einstein theory and modern physics, though familiar to specialists, deserves a more widespread and general notice than it has hitherto received. At any rate, such a study may serve to place Kant in perspective, and to humanize what is often felt to be the most abstract part of his system.

In Newton and Leibniz Kant found conflicting teachers. Newton had distinguished absolute and relative space, absolute and relative motion.

<sup>&</sup>lt;sup>1</sup>Smith, Norman Kemp, A Commentary to Kant's Critique of Pure Reason, p. 22-25.

Leibniz had made them all relative, for, according to his view, apart from objects existing or conceived, space and time do not exist. Newton associates this relational view with popular notions and prejudices. He says:

"I do not define time, space, place, and motion, as being well known to all. Only I must observe that the vulgar conceive these quantities under no other notions but from the relation they bear to sensible objects. And thence arise prejudices for the removal of which it will be convenient to distinguish them into absolute and relative, true and apparent, mathematical and common."

"I. Absolute, true, and mathematical time, of itself and from its own nature flows equably without regard to anything external, and by another name is called duration: relative, apparent and common time is some sensible and external . . . . . . measure of duration by means of motion, which is commonly used instead of true time, such as an hour, a day, a month, a year.

"II. Absolute space, in its own nature, and without regard to anything external, remains always similar and immovable. Relative space is some movable dimension or measure of absolute space, which our senses determine by the position of bodies; and which is vulgarly taken for immovable space; such as the dimensions of subterranean, or aerial, or celestial space determined by its position in respect of the earth."

Similarly Newton draws the distinction between absolute and relative position, and absolute and relative motion. Though he states these propositions dogmatically as facts they are probably no more than axioms which seemed to him self-evident, and which aided him in clear thinking. It is still possible, in spite of the most recent contributions to science, to adopt as one's foundation axioms the Newtonian space and time, and the Euclidean geometry. They may not

<sup>&</sup>lt;sup>2</sup>Newton's Principia, Daniel Adee, 1846, pp. 77-78.

be the neatest or most simple axioms, and their self-evidence is no longer conceded, but they can hardly be successfully overthrown. The corollaries are that the world is infinite in extent, that it is infinitely complex at all stages, and that it has no limits in time. In other words, it leaves us in a position of being unable fully to comprehend our world in its extent, complexity, or duration. It solves the antinomies of Kant by denying the thesis—that the world is finite—and asserting the antithesis—that the world is infinite.

Although for all practical purposes we may adopt the axioms of absolute space and time, there are difficulties involved which are more easily passed by than solved. Since all points of reference and all measurements are relative to human limitations and purposes, where shall be found the basis for the immovable space and the evenly flowing time? Newton felt the difficulty and took refuge in the theory of an all-pervading and immovable ether. This seemed so satisfactory that very little doubt was cast upon it, especially in view of the wave theory of light, till the negative results of the Michelson and Morley experiment of 1887 shook the confidence of the experimenters and the expectant world.

As for time, the conception of an absolute time, in relation to which all specific times stand, seemed to be demanded by the then recent discovery of Roemer\* of the fact that light requires time for its propagation through space. To Newton this fact appeared conclusively to prove that there is a flow of time independent of any personal reference. It seemed to overthrow all theories which made time a matter of the succession of impressions or the mere strung-outness of experience or the relation of events of the world. The fact that all calculations had to be checked and

<sup>&</sup>lt;sup>3</sup>Newton, however, thought it not inconceivable that God had created the world at a definite time.

<sup>\*</sup>Roemer discovered that light requires time for its propagation and calculated its velocity in 1675; the *Principia* was published in 1686.

amended by taking account of the velocity of light seemed to give space and time an absoluteness that was inescapable.

Difficulties, however, were forced upon Newton's notice from the fact that no human observer can get a point of view that is in any sense absolute. Newton's reply was that absolute space and time are indeed beyond human perception and experience, but that they are God's sensorium. What for man is a vague conception and beyond his perception is for God a matter of clear perception. In the Optics he says:

"Do not these phenomena of nature make it clear, that there is a being incorporeal, living, omnipresent, who in infinite space as his sensorium sees, discerns and understands everything most intimately and with absolute perfection."<sup>5</sup>

This, of course, is the exact reverse of the position of Leibniz, his most illustrious contemporary and critic. Leibniz, beginning at the other end, and working from the nature of God to the necessary nature of the world, holds that space is in the world, not the world in space; that space and time are our confused way of reflecting the universe, whereas for God space and time do not exist; that space and time are merely the order of coexistence and succession respectively; that they are therefore entirely relative and are mere modes of our perception.

Kant, therefore, found in these two predecessors conflicting teachers. Newton was in the ascendancy and exerted the more direct influence, especially in the earlier works. Kant's earlier papers are nearly all on subjects connected with physics, mathematics, and astronomy, reflecting the Newtonian influence. His power of independent and constructive thinking, however, was soon manifested. In 1763 his paper on "The Conception of Negative Quanti-

<sup>&</sup>lt;sup>5</sup>Quoted from H. Wildon Carr, The Principle of Relativity, p. 21.

ties" was written—a rather original contribution to the discussion showing among other things the relativity of the concepts of plus, minus, and zero. This paper is of some interest as indicating the working of his mind in the direction of a general relativity. The difficulty of reconciling Newtonian and Leibnizian space resolved itself by 1768 into what theoretically was its final solution. In a little paper<sup>6</sup> published that year he mentions a lost paper supposed to have been written by Leibniz on analysis situs. Since it was either lost or never written, Kant says, he will attempt to write what Leibniz included, or should have included in that paper. He then puts forward the theory of space which is included in the Dissertation of 1770 and included practically unchanged in the Aesthetic. His thesis in brief is that relative space, relative time, relative motion imply absolute space and time, not in the Newtonian sense, but as ein Grundbegriff, or fundamental conception, logically preceding all relations of coexistence and succession. He thus agrees with Leibniz that space and time are relative so far as they are given in experience in the forms of extension and succession; but he agrees with Newton in that the relative implies the absolute space, time, and position; and he differs from both in maintaining that they are not merely relations, nor yet immutable things, but are a priori forms of sensibility determined by the peculiar nature of human perception.

Stated thus baldly his solution seems formal. Kant's discussion in the Aesthetic has always seemed to me too abstract to give the reader anything like an insight into the significance of his problem or the value of his contribution to the discussion. The following account therefore centers on one of his latest works, "The Metaphysical Foundations of Natural Science" including "Phoronomy," the

<sup>8</sup>Von dem ersten Grunde des Unterscheides der Gegenden in Raume, Werke (Hartenstein), v. 2.

"Dynamics," the "Phenomenology," and the "Mechanics."

### MOTION

So far as motion is concerned Kant definitely and completely rejects the Newtonian conception of the absolute-"Motion of a thing," he says, "is the change of the external relations of the same to a given space." And it is immaterial, he goes on to explain, whether you consider the body at rest and the space as moving, or the space at rest and the body as moving. There is nothing to show what belongs to the object, but only its relation to the observer. "For if the spectator place himself in the same space as resting, he terms the body moved: but if he place himself in another space enclosing this, in respect of which his body is resting, then the relative space is termed moved."8 For example. in the popular illustration, if the billiard ball rolls toward the back of the table as the train gets up speed, to a person in the train it will appear to be in motion while his compartment is at rest, while to a person on the platform and looking through the window the ball will appear to be at rest while the compartment is moving forward and the table is slipping from under the ball. The descriptions are equivalent.

Even if there were only two bodies in an otherwise empty space it would be impossible to conceive of their motions as absolute, "the motions of both being here not relative to the space surrounding them but only to that between them, which alone determines their external relation to each other and is thus only relative." Again, in the popular illustration, a person in the train sees the station

<sup>&</sup>lt;sup>7</sup>Kant's Prolegomena and Metaphysical Foundations of Natural Science, Bohn, Ed., 1883, p 152. All further references to this work will be to this same edition.

<sup>81</sup>bid., p. 234.

<sup>&</sup>lt;sup>9</sup>Illustration from Steinmetz, Space and Relativity.

<sup>10</sup> The Metaphysical Foundations of Natural Science, p. 152.

approaching, and a person on the platform sees the train approaching. Both are right since each carries his system of reference with him.

"The only possible absolute motion," Kant says, "would be that accruing to a body without relation to any other matter. But such would be the rectilinear motion of the *universe*, that is, the system of all matter." Even this rectilinear motion of the universe as a whole could never be asserted as a fact or proved, but would have to remain as a mere possibility outside the realm of experience. In other words, absolute motion and absolute rest would be strictly equivalent.

Kant's position is simply that there is no frame of reference that is universally valid or that is in any way specially privileged, but that the system depends upon the position of the spectator, or the position which he imaginatively adopts. This amounts to the statement of the more subjective relativists that each one carries in himself his own frame of reference. Kant's illustrations are the stock ones used today in popular expositions of the theory of relativity to illustrate the same points.

Thus, if a boat is moving down a stream it is at rest in relation to other objects moving down the stream at the same rate. To an observer on the bank, however, the boat is in motion. Thus a point can be in rest and in motion at the same time. Similarly a point can move in opposite directions at the same time so that the sum of its movements is zero. For example, if a man walks from bow to stern of the boat at the same rate as the boat is moving down stream, with reference to the man on the bank he has remained at rest. If he walks at right angles to the direction of the movement of the boat, his motion, from the bank, is diagonal, being the mathematical resultant of the two motions. These and many similar examples illustrate

<sup>11/</sup>bid., p. 238.

the simple but fundamental principle that there is no system of coordinates that is universally valid. Movement and velocity are relative to the space-time coördinates with reference to which the measurement is made.

Newton had held that relative motions are all parts of a motion which is absolute to the ether, or the structure of space as a whole. He even attempted to give a demonstration of this. He asks us to imagine a pair of connected spheres, like a dumb-bell, hurled into space with a twirling motion so that it rotates about its common center of gravity. Even though there were no other body by which its inhabitants could observe its rotation, nevertheless both the fact that it rotated, and the direction of its rotation, could be discovered from the stresses of the connecting bar.

Kant quotes Newton and improves upon his example. He says that the rotation of the earth might be demonstrated even if there were no visible heavenly bodies by which to mark it. If it rotates, or if it moves in a circle, then it must be subject to some external force, and that force would have other effects which might be discovered. The rotation of the earth, he suggests, might possibly be demonstrated by sinking a deep shaft into the earth and dropping weights down. If a stone, instead of dropping perpendicularly, tended slightly toward the east, one might infer that the earth was rotating from west to east (because the stone was given a greater velocity at the surface of the earth than the earth has towards the center, and by inertia it tends to keep that velocity and go faster than the objects toward the center). I have never heard of Kant's experiment being tried. Foucault, however, some years later, demonstrated the earth's rotation by a simple experiment with a pendulum using the same principle of inertia which was at the bottom of Kant's suggestion.

But, asks Kant, what is the interpretation of these facts? Do they prove absolute motion? Not at all. While

circular motion "seems to be really absolute motion", these experiments would only prove it to be real rather than illusory. "It is nevertheless no absolute motion, but continuous change of the relations of matters to one another", and consists in "the conception of the reciprocally continuous retreat of each part of the earth (outside the axis) from every other part situated opposite to it in the diameter."

Hence as far as experience goes and as far as reason demands there is no such thing as absolute motion. Kant sums up his conclusions thus: "Firstly, that all motion or rest is merely relative, and that neither can be absolute, i. e., that matter can be conceived merely in relation to matter, but not in relation to mere space without matter; in other words, that absolute motion, such, namely, as is conceived without any reference of one matter to another, is simply impossible." 18

#### SPACE

Strangely enough, from the relativity of motion Kant deduces a sort of absolute space—not, of course, the immovable continuum of Newton in which all things are contained, but an intuition coming from the very nature of sense perception. We do not perceive space nor yet construct it, for it is the prerequisite of every perception and construct. Spatiality is one of the forms in which all objects are given. This would not necessarily prove that space is absolute, but only that it is an absolute fact that sense perception involves a spatial character. Why, then, does he adopt the absolute side?

What his argument in the *Phenomenology* amounts to is this: The law of inertia is fundamental to physical science, i. e., the conception of uniform motion in a straight

<sup>12</sup> Ibid. p. 239-241.

<sup>13</sup> Ibid., p. 238.

line. Such a motion, however, is not a matter of experience since no one has ever observed true rectilinear motion; it is a mere possibility or idea, especially as applied to the system of the universe as a whole. Back of the conception of uniform motion in a straight line must lie the conception of a space which is unmoved in relation to the motion. Absolute space, then, is a conception still more fundamental than that of rectilinear motion. Even if you think of this space as moved you must conceive of a still wider space in relation to which it is moved. Hence back of all physical law, back of all experience, actual or conceived, lies absolute space, not as an object of experience but as a necessary idea. His conclusion therefore is:

"Absolute space is then necessary, not as a conception of a real object, but as a mere idea which is to serve as a rule for considering all motion therein as merely relative, and all motion and rest must be reduced to absolute space if the phenomenon of the same is to be transformed into a definite conception of experience."

Kant's argument in this is not very convincing since the more obvious deduction would seem to be that motion and rest are relative terms, the one as fundamental as the other, and hence that the conception of an unmoved space in which relative motion takes place is unnecessary. This conclusion should have been the more obvious from his oft repeated assertion that it is immaterial whether you consider the body as moved and the space as resting or the body as resting and the space moved, or even both body and space as moving at the some time. Indeed Kant was well aware that absolute space enjoyed a very tenuous existence in his system, and depended on the demand, impossible of satisfaction, for completion to infinity.

"Absolute space is in itself nothing and no object at all,

<sup>14</sup> Ibid., p. 239.

<sup>15</sup> Ibid., p. 233.

but signifies merely every other relative space that I can at any time conceive outside the given space, and that I can extend beyond the given space to infinity...."16

This is an absolute space in a very different sense from that of Newton. It requires no immovable ether to justify it, and can be overthrown by no Michelson-Morley experiment. Nor is it God's sensorium, but only man's refuge from relativity.

That all particular spatial relations are relative is conceded by Kant. Indeed it is a direct corollary of his theory that space is an a priori form of sensibility. If space relations are functions of the organism or of mind, then they will be different for child and adult, for earth man, moon man, and Jupiter man, for flat-land folks and for fourth dimensional beings. Kant, in the earlier period, at least, was fond of speculating on the space relations on little Mars and big Jupiter, and of wondering whether disembodied spirits had space relations such as ours or perchance none at all. What things are in themselves, and whether space and time are attributes of them at all, we have no means of knowing. All we know is that for us things are presented in forms of space and time, and such forms are relative to human mind and sense.

Absolute space, then, finds little justification either from considerations of man or nature. The real source of Kant's views of space came, as we all know, from his high regard for the apparent certainty and stability of the achievements of mathematics. In the preface to the "Metaphysical Foundations of Natural Science" he exclaims:

"Newton in the preface to his mathematical principles of natural science . . . . . says: geometry is proud of being able to achieve so much while taking so little from extraneous sources. One might say of metaphysics, on the other hand: it stands astonished that with so much offered

<sup>16</sup> Ibid., p. 151.

it by pure mathematics it can effect so little."17

His insight into the place of mathematics in the natural sciences is indicated by his saying that "in every natural science doctrine only so much science proper is to be met with as mathematics"; and again, "a pure doctrine of nature respecting determinate natural phenomena . . . is only possible by means of mathematics." He thought, for example, that chemistry could never become a proper science, "being incapable of the application of mathematics." Still less could empirical psychology become amenable to mathematical treatment. We have seen his prognostications largely disproved, not because he had a false impression of the function of mathematical constructs as the basis of any science, but because he could not forsee the developments of physical chemistry or statistical psychology.

Kant perceived that in order to understand nature we have to reconstruct nature and put it into forms of our own. Now pure numbers and geometry he thought to be the a priori forms which are peculiarly our own. They do not come from experience, he thought, but are pure constructs derived from the nature of our pure intuitions of space and time. To understand nature, then, we must assimilate it into our own being and reconstruct it in the molds of pure number and geometry.

This conclusion was based on what we should probably all agree to be a false assumption regarding the nature of pure mathematics. He assumed that their truths are absolutely certain, universal, and necessary, and apply without question to the objective world in which we live and move. We should probably agree with Hume that any a priori certainties in mathematics are analytical in the sense that they are derived directly or indirectly from the fundamental axioms, definitions, and postulates which form the

<sup>17</sup> Ibid., p. 149.

<sup>18</sup>Ibid., p. 140-141.

starting point of the particular branch of the science. We should also agree with Hume that to the extent to which these assumptions are derived from experience, or are thought to apply to the real world, they are subject to the same fortunes as any other empirical truths. For example, given that through a given point to a given straight line one and only one parallel can be drawn, it follows that the three angles of a triangle are equal to two right angles. But not long after Kant's death Riemann showed that there is nothing to prevent the assumption that through a point outside a given straight line two straight lines can be drawn which intersect at an infinite distance (i. e., two parallel lines), and that any number of lines can be drawn which do not intersect at all. In this case the three angles of a triangle would be less than two right angles.

Again, Lobatschewsky showed that one might assume that any two straight lines whatever in a plane intersect at a definite distance; that is, parallels do not exist. This is the axiom of spherical or elliptical space. In this case the three angles of a triangle would be more than two right angles. This elliptical space, combined with time as a fourth dimension, constitutes the Einstein four-dimensional non-Euclidean, spacetime which he believes to apply to this world of ours.

If it is true, then, that the synthetic truths of geometry have the same adventure of truth and error as the synthetic propositions of any other field of research, then it becomes unnecessary for Kant to demonstrate the possibility of a priori synthetic truths of mathematics. We read out of a triangle what we have previously read into it just because the science is at bottom analytical and hypothetical. Had Kant not been led astray by the apparently immutable character of mathematics (so soon to be overthrown), and developed the relativistic implications which he so suggestively commenced in "The Metaphysical Foundations of

Natural Science," an altogether different turn would have

been given to philosophy.

As it was he got into the antinomies of the finite and the infinite and never successfully extricated himself. Einstein avoids the antinomy by the assertion that the world, at least for us, is definitely finite. A point travelling in a straight line returns to its starting point; a point indefinitely distant on the right coincides with a point indefinitely distant on the left. The world is, like the surface of a sphere in two-dimensional space, limitless or boundless, yet not infinite. The universe, both as regards extent and mass, has finite limits and can be measured. According to Einstein's calculations the whole universe has a diameter of approximately 100 million light years, or about 700 trillion miles. The exact figure, of course, does not matter to us. What is important to recognize is that it is possible to regard the universe as a closed continuum as far as distance measurements are concerned.19

Moskowski, who reports his conversations with Einstein on the above point, finds it impossible to avoid the question as to what lies beyond. In other words, he cannot escape Kant's antinomies.

"'Nevertheless' said I (Moskowski) 'your universe pictures something inconceivably great: one might call it infinity expressed in figures. For in your world there still remains one property of infinity, namely that it imposes no limitations of motion of any kind. On the other hand, the figures proclaim a limited measure in the mathematical sense, however great this measure may be. This calls up the old restlessness of mind, due to the persistent question: What lies beyond? The absolute nothing? Or is it a something which yet does not occupy space? Descartes and many other great thinkers have never overcome this difficulty, and have always affirmed that a closed world is im-

<sup>19</sup> Moskowski, Einstein the Searcher, p. 123ff.

possible. How, then, is the average person to reconcile himself with the dimensions you have established?'

"Einstein gave an answer which, it seemed to me, offered a last escape to apprehensive minds. 'It is possible' so he said, 'that other universes exist independently of our own'."<sup>20</sup>

Whether or not this solution will strike the enquirer as satisfactory I do not know. Moskowski thinks that it forms a bridge between the thesis *finite* and the antithesis *infinite*.

Einstein himself, however, "clings with unerring logic to the strict mathematically defined conception of infinity, and allows no compromise with the non-infinite." That is, he adheres strictly to the conception of the universe as finite and measurable. As Newton adopted the antithesis infinite, Einstein adopts the thesis finite.

#### TIME

It is a rather striking fact that while Kant devotes a large part of "The Metaphysical Foundations of Natural Science" to the analysis of space, motion, and matter, he gives no corresponding analysis of the *time* element of motion. This is probably due to a fundamentally different view which he held of the nature of space and time. Not till Bergson was time reinstated as an essential correlate of space and motion.

In the Aesthetic Kant adopts the position that time and space are widely different and distinct kinds of manifolds. The one he calls the form of outer sense, the other the form of inner sense. Space he treats from the mathematical and dynamical point of view, time from the psychological point of view. One gives us the outer world at an instant, the other the succession of impressions as represented in the stream of consciousness. It seems illogical that he should have adopted these two widely different bases of

<sup>&</sup>lt;sup>20</sup>Ibid., pp. 123-124.

analysis, and I am convinced that it led astray not only Kant but many who followed him. In the analogies, however, in the analysis of causality, he combines space and time

in a way which is very suggestive.

To begin with, he tells us in the first Analogy that "change and succession are nothing but so many modes of time in which the permanent exists," and "without something permanent no relation of time is possible." Just as the relative in space implies an absolute space, so the relative in time implies the permanent. This does not prove an absolute time in the Newtonian sense of an even flow of change, but on the contrary it proves the reality of the permanent or timeless. As in the analysis of space, however, the obvious conclusion should have been that change and permanence are relative concepts, change having no meaning except in relation to the relatively moving. Bergson goes to the other extreme, making not permanence but change the most fundamental reality. Bergson's position is as rational as Kant's and no more so-each has seized on one of two relative concepts.

The inseparable conjunction of space and time, and hence the error of his widely different analysis of these two elements of motion, is brought out by Kant himself when he tries to distinguish extension and succession. Even the apprehension of space, he points out, necessarily involves a succession of impressions and hence time. To take in a building, for example, the eye must travel from foundation to roof line and from end to end, and rest on many points as it moves. Still more clearly is a succession of impressions necessary if the preception of extension comes from the sense of touch where the finger tips move all over the surface of the body. Hence even space is apprehended through a succession of impressions or by means of an inner manifold. There would seem, then, no sound reason for Kant's distinguishing time and space as inner and outer

sense. He might also have readily seen that lapse of time is only discernible by means of change in the outer world as perceived or imagined. Indeed, he points this out. How, he asks, can we distinguish the flux of impressions which give us space from the flux which gives us time? Simply, he answers, from the fact that you can reverse the space order but cannot reverse the time order. For example, a boat is seen on the river, is hid behind the hills, and is seen again further down. We get the same space whether we let the eye travel up-stream or down-stream or both in succession, but we cannot reverse the time situation in this way. It is plain from this illustration that the perception of time has involved space—up-stream and down-stream.

The space-time conception is still further strengthened when he introduces the concept of *event* with its ultramodern ring, and shows that no object at all can be represented without succession.

"But as soon as I perceive or anticipate that there is in this succession a relation to an antecedent state from which the representation follows by rule, then something is represented as an *event* or as something that happens: that is to say, I know an object to which I assign a certain position in *time*, which, after a preceding state cannot be different from what it is."<sup>21</sup>

Now when we take an object and assign to it a definite position in time (with reference to a more or less arbitrarily chosen starting point or set of events) we have what in relativity is called four-dimensional spacetime with three co-ordinates in space and one in time.

# Conclusions

In attempting to evaluate the contribution of Kant to the problems of space, time, and motion it is necessary to

<sup>&</sup>lt;sup>21</sup>Critique of Pure Reason, tr. by Max Müller, p. 173.

keep in mind the tools at his disposal. The non-Euclidean geometries had not yet been developed, nor had the concepts of the electro-magnetic field. Kant, therefore, had essentially the same tools as had Newton and Leibniz. As compared with Newton he definitely abandons the view that we can ever demonstrate experimentally, or have any evidence from nature, that there are such things as absolute space, absolute time, or absolute motion. As far as experience is concerned he holds to the thorough-going relativity of space, time and motion. Moreover, the concept of absolute motion is itself unnecessary and impossible. But, quite illogically, it would seem, he thinks that the concept of relative motion involves the concepts of absolute space and time. The absolute is therefore retained in the case of space and time, not as possible objects of experience but as necessary concepts. This constitutes a definite advance over the position of Newton, forestalls the negative results of the Michelson-Morley experiment, and anticipates in some striking ways the relativity of Einstein.

Though led astray by the fact that he analyzed the concepts of space and time from such widely different points of view, he has in places related them in the concept of 'event' in a way almost worthy of an up-to-date mathematical philosopher. That is, as far as phenomena are concerned, he has not only a space relativity and a time relativity, but a spacetime relativity.

While recent relativity has developed from physical and mathematical calculations it is obvious that its main significance will not be confined to these fields. The extent to which it amends the simple formulae of Newton are too infinitesimal to make any serious difference to ordinary affairs or even theoretical computations. Even if the perihelion of the orbit of the planet Mercury does move forty-three seconds of arc in the course of a hundred years, in a hitherto unaccountable manner, or even if the star ray

is bent about one and seven-tenths seconds of arc as it passes the sun, these facts are of too minute magnitude seriously to upset the world. But the main significance of the results lies in the different view of the world that they suggest. It seems to me that what we get is an extension of the Kantian view of the world. Newton had held that entirely apart from human perception space broadens infinitely and time flows evenly and indefinitely. Infinite space and time are God's sensorium. Kant held, on the contrary, that space and time are functions of the organism. It is pure dogmatism, he held, to assume with Newton, that they are God's sensorium, or with Leibniz that for God they do not exist. What we do know is that for men and animals they are functions of the organism. They are objective in that all objects are presented in those forms, and in the sense that all human beings share the intuitions. Nevertheless, each man has his own point of view in analyzing an event. In much more thorough-going and precise form Einstein has taken the position that each moving system has its own spacetime co-ordinates and each man carries in himself his own system of reference. It is a long gap between Newton and Einstein but Kant is the significant connecting link.

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### THE SYSTEM OF BRADLEY

THERE can, I think, be no doubt but that Bradley was a philosopher who rose high above his contemporaries in originality and independence of thought. The system of Bradley, like the systems of Spinoza or Berkeley or Hume, has gained few adherents, but who does not recognize in Bradley the strongest and most original thinker in English philosophy since the time of Mill? A study of Professor Muirhead's symposium Contemporary British Philosophy shows everywhere the influence of that subtle, critical dialectic, which was not only preparatory of Bosanquet's system, but which was negatively so important in the development of both Pragmatism and Realism.1 A great source of Bradley's power consisted, presumably, in the fact that he made no appeal to authority, whether to the authority of philosophic tradition, science, religion or morality. He relied exclusively on the power of argument and freed himself from all dependence on others, even on Plato and Hegel. The unity and consistency of his system, combined with the fundamental clarity of his thought, are such as to make it a classical philosophical construction and it is safe to say that it will survive most of its contemporaries.2 It will be studied, just as other classical systems of philosophy are studied, not as an embodiment of ab-

<sup>&</sup>lt;sup>1</sup> In Muirhead's Contemporary British Philosophy (First Series) there are, by the Index, 28 references to Bradley, more than twice as many as to his closest rivals in modern English philosophy, namely, Russell and Whitehead, who have 11 references each.

<sup>&</sup>lt;sup>2</sup> A German publisher announces the publication in the near future of a translation of Appearance and Reality.

solute truth, but as an argument, as a logical exercise, which although not in itself irrefragable, yet throws light on the problem of human life.

Of all cases of the superficial classification of systems, the description of Bradley as an Hegelian is probably the most misleading. Fundamentally, the system propounded in Appearance and Reality is a variety of Berkelevan or psychological idealism and it possesses neither the strength nor the weakness of a purely logical idealism. The system of Hegel, on the other hand, as set forth by Hegel himself, was above all a type of rationalism, more specifically an example of dialectical rationalism. It moves primarily in a world of pure logical ideas, i. e., of pure logical categories. Pure thought, a self-evolving system of logical concepts, is for Hegel the core of reality. Now the fundamental tendency of Bradley is anti-intellectualistic. Far from representing the opposite pole to Bergson, as William James thought, Bradley represents simply another type of anti-intellectualism. His negative dialectic is a critique of the "abstract concepts of the understanding" and the outcome of his doctrine is that there is an inevitable inadequacy in our abstract concepts when applied to the concrete. The real is the concrete, the object of a possible sensuous or quasi-sensuous perception, and when measured by this standard our ideas are, as Bradley endeavors to show, always deficient. Now a logical idealism, such as is found in the systems of Plato and Hegel or Hermann Cohen, for example, always asserts that the idea is prior to reality or sensuous existence. Existence is measured by the standard of ideas and what does not conform to the demands of thought is forthwith declared to be unreal. But in Bradley's system the idea is measured by comparison to reality and is found wanting.

What was for Hegel a positive instrument for the dis-

covery of truth, the Dialectical Method, is used by Bradley in a merely negative way. The discovery of aporiae serves merely to degrade various seeming types of reality to the level of appearances. Unity and variety, relations, time and space, the self, nature as an object of knowledge, and the fundamental ethical and religious concepts are all dialectical in character. They contain contradictions, but these contradictions are always symptomatic of just one thing, namely, the merely apparent nature of the being under investigation. X is contradictory, therefore it is unreal. And what Bradley seeks is an undialectical realm, a being which shall be free from contradictions. notion of an endless dialectic, of contradiction behind contradiction, is not to be found in his system. What he seeks is freedom from dialectic and this he finds only in the Absolute. Hence the Absolute is the end of all thought. It is an idea which cannot be further developed, since it is by definition free from contradiction. Now it is precisely at this point that Bradley ceases to be dialectical and becomes dogmatic. He assumes, without proof, that there must be such a thing as contradictionless reality. There must be an end to the process of thought; somewhere thought must come to rest. The subjective fatigue of the dialectician is transformed into an absolute end of thought. There must be a real which is perfectly selfcontained and also completely consistent. This is the Absolute in which "somehow" all contradictions are resolved. And yet it really resolves none of the detailed contradictions which Bradley discovered, nor is it itself free from contradictions. Here is the chief difference between the Hegelian and the Bradleyan use of Dialectic. The method, as used by Hegel, was constructive and engendered a series of concepts of which each remedied the inconsistencies of the preceding concept. A system or series of concepts

arises, which might conceivably stretch out to infinity, although Hegel, of course, does not draw this conclusion. But in the case of Bradley Dialectic is used in a merely negative way and the non-dialectical Absolute is set forth in a bald, dogmatic fashion. The Absolute has such and such properties, Unity, Consistency, Consciousness, Perfection. The dialectic which had been used with such destructive power elsewhere is not applied to the Absolute. From this results what we may call the finitism and finalism of Bradley's metaphysics. The Absolute is proposed as a final solution of all problems which thought can do nothing but accept. There is evidently a possibility here, which it did not occur to Bradley to explore, the notion that reality is through and through dialectical, that thought can never hope to reach a final resting place, that it must pursue the Absolute through an endless series of appearances.3 Such a doctrine would at least have promised an endless life to thought.

In the closing sentences of Appearance and Reality Bradley rejects the Hegelian identification of the real with the rational and proclaims in its place the principle of the spirituality of the real. "Reality is spiritual. Outside of spirit there is not and there cannot be, any reality, and, the more that anything is spiritual, so much the more is it veritably real." This proposition admirably condenses the total import of Bradley's argument. The real is the spiritual. That is, the real is the psychological, the mental. The softening of the Hegelian panlogism into Berkelevan spiritualism indicates precisely why it is improper to consider Bradley an Hegelian. There are for Bradley no categories save those of psychology which are applicable to the Absolute. The Absolute is described in terms of Thought, of Feeling, of Will, and, above all, in terms of Experience. Such concepts as those of mathe-8 Cf. Cohn's Theorie der Dialektik, Leipzig, 1923.

matical time and space, matter and force, or even of life and evolution in the biological sense give no clue for understanding reality. And the inner life is taken in no abstract way; Bradley is rather a keen and subtle psychologist perpetually bent on gaining the true psychic actuality and escaping all the "fictions" and "monsters" with which popular psychology is satisfied. In his discussion of the self, for example, he fairly outdoes Hume in his effort to discover the self in the concrete, in its introspective givenness. And it is in terms of what were for Bradley the actualities of introspection, that he seeks to interpret the real.

The introduction of psychological idealism takes place very openly and logically in the course of the deduction of the general nature of reality. Reality is consistent; that, says Bradley, we have assumed all along. Secondly, the real is one; this follows simply from the impossibility of absolute pluralism. Thirdly, the content of reality is sentient experience. It is this third theorem which constitutes Bradley's psychological idealism. "Sentient experience, in short, is reality, and what is not this is not real."4 And in proof Bradley offers what has since been exposed —there is, I think, no dogmatism in using this word—as the fallacy of argument from the ego-centric predicament. "Find any piece of existence, take up anything that anyone could possibly call a fact, or could in any sense assert to have being, and then judge if it does not consist in sentient experience. Try to discover any sense in which you can still continue to speak of it, when all perception and feeling have been removed; or point out any fragment of its matter and aspect of its being, which is not derived from and is not still relative to this source. . . . Anything, in no sense felt or perceived, becomes to me quite unmeaning."5 That Bradley should have thought that

<sup>&</sup>lt;sup>4</sup> Appearance and Reality, p. 144.

<sup>&</sup>lt;sup>5</sup> Cf. ibid., p. 145.

there was here an *a priori* proposition, to be proved in so simple and direct a fashion, can only be explained by reference to the underlying and pervasive influence of Berkeley in his thought. Perhaps in the end some such proposition can be proved, but the attacks of the neorealists have made it sufficiently plain, I think, that what is self-evident here is that what I perceive I perceive, while that the perceived entity cannot exist apart from the perceiver is a synthetic proposition which must be substantiated from some other source. No doubt the real, in one sense of the term, may be defined as that which is a possible object of sense-perception, but it hardly follows from this that the real is always everywhere an actual object of sense-perception.

The real then is experience, the one all-inclusive experience of the Absolute. From this it is no great leap to the assertion of the perfect happiness of the Absolute and to the discussion as to whether or not the Absolute enjoys a surplus of pleasure over pain. Bradley's bold question as to the amount of pleasure in the Absolute was due to his psychological empiricism and his desire to be concrete. A greater contrast between a logical idealism and that of Bradley could, however, hardly be found than in the question as to whether Reality experiences pleasure or not. Pleasure does not belong to the logical idea nor even to man as a rational being; pleasure and sense-experience belong to the animal man. And yet these seemingly lowly animal functions are made by Bradley into the very stuff of reality. For what is the Absolute but a gigantic piece of sensuous experience saturated with emotion? And how could a less rationalistic conception of the Absolute be formed?

The criterion of reality is the boasted principle of individuality and value. It is this principle which is to distinguish the "degrees of truth and reality" and thus establish the hierarchy of being. It consists of the two correlative principles of harmony and inclusiveness. The more inclusive an idea or a theory is, other things equal, the truer it is; the degree of truth varies with the range of facts covered by the idea. Again, other things being equal, the truer idea is characterized by a greater degree of internal harmony. The more real is, consequently, the more inclusive and the more harmonious. Bradley devotes a good deal of effort to proving that these two principles are really the same, and the connecting link is what the realists call the internal theory of relations. Grant that everything is essentially related to everything else, then that which is limited and partial will be the more contradictory. The two principles or criteria thus are resolved into one, which Bradlev calls the principle of individuality. This principle, however, Bradley was unable to apply in detail in the sense of working out a definite scale of being. His actual treatment of appearance is always negative and is based primarily on the discovery of contradictions.

The abstract and formal theory of the internality of relations which Bradley takes for granted, without either naming or explicitly stating it, is really in the end paradoxical and self-contradictory. The theory asserts that nothing exists "apart from" anything else; hence until a man knows everything, all his knowledge is false. Since one does not know everything, one does not know anything. This theory is itself self-contradictory. It makes all partial knowledge impossible, and since the internal theory of relations itself claims to be knowledge, it too is false, since even its advocates do not know everything. Now this might be interpreted to mean that human thought is essentially dialectical and unable to free itself from contradictions. If this were true Bradley's own

system could not logically make the claims to absoluteness and finality which distinguish the concluding chapter, strangely entitled, "Ultimate Doubts."

No doubt the internal theory of relations has its good meaning. If we take it simply as denying the external theory of relations, as denying the ultimate discreteness and discontinuity of the real, it represents a strongly defensible position. The denial of absolute monism need not lead to an equally absolute pluralism of logical entities. The logical atomism of the neo-realists seems to be at least as artificial and unfounded as the Bradleyan monism. A similar remark would apply to Bradley's supposed proof of psychological idealism. The recognition of the fallacy of argument from the ego-centric predicament by no means commits one to any form of realism. That is to say, even though it is going much too far to hold that all reality is experience, the difficulties attaching to a theory of the external world as absolutely real and independent of all reference to consciousness remain. Certainly the dialectical difficulties connected with any form of realism are equal to those connected with subjective idealism.

Let us, however, return to the "principle of individuality" in its dual form, that is, in the form that the criterion of truth and reality consists of two things: harmony and inclusiveness. The connecting link, by which Bradley sought to prove that these two criteria are really the same, the internal theory of relations, may be omitted. These two properties together may be taken as defining a principle of value in general which has, at least, a considerable sphere of application. Thus, roughly speaking it is true that, in science, that hypothesis is the truer which explains more facts more harmoniously. That type of reality is more real which unites more appearances more

harmoniously. In the field of ethics, we may perhaps say with Plato that the good soul is harmonious as well as the good state, and the good in practical experience would consist in the greatest possible harmony of the richest possible experience. Harmony and inclusiveness may very plausibly be regarded as common features of the good wherever it is found, whether in cognition, in beauty, or in practical life. Plotinus says: "Health also exists when the body is organized as a unit, and beauty when the nature of the one holds the parts together, and virtue in the soul when she is made a unit and unified in a single harmony."6 Unity and inclusiveness may well be taken as representing the two essential demands of the soul: the formal demand for unity or consistency and the material demand for richness of concrete experiential filling.

Two things are to be pointed out, however. In the first place, there is no need to assume that these ideal demands of the soul are actually embodied in anything. The criteria or norms of the soul remain valid as norms even though embodied in no actual existence. The existence of these norms, as embodied in the Absolute, by no means adds anything to their authority as norms. Let us rather recognize them as inherent standards or principles of consciousness as such, the true a priori in terms of which we judge and measure our experience. If we develop this idea we come to see that after all it is consciousness with its standards which is the measure of reality. Its ideals are prior to reality in that it only recognizes as real or as good or beautiful what conforms to them. It is not consciousness which must bow to absolute reality; it is rather reality which gains its being only to the extent that it conforms to the laws of thought. The principle of harmony and inclusiveness may well be the criterion of reality <sup>6</sup> Enneads, VI, 9, 1. Trans. by Fuller.

by which we distinguish levels of being; it need not for that reason be regarded as having in addition a *de facto* existence in the Absolute.

A second thing to be noted is that it is dangerous to assume that the principle of harmony and inclusiveness necessarily leads to one Absolute in the three fields in which it can be applied, Logic, Ethics and Aesthetics. We need not assume that the maximum in each of these fields is identical with the maximum in the other two fields. That which wholly satisfies our cognitive powers, the absolutely real, need not thereby be the maximum of goodness or of beauty. To confuse the being which satisfies the intellect with that which satisfies the moral will. and this again with that which pleases the feelings, the Beautiful, is most questionable and is in fact the logical foundation of that tendency to mystical religion which is such a powerful motive in Bradley's system. To fail to keep Logic, Ethics and Aesthetics distinct and autonomous means that the maximum of goodness and beauty also possesses, even now, and apart from our effort, the maximum of reality and that the life of practical achievement and aesthetic creation is superfluous.

What is really strong and suggestive in Bradley is his negative dialectic. In the discovery and bold clear treatment of aporiae Bradley has no superior in the history of philosophy. It is when he seeks to set up a positive theory of reality that his weakness shows itself. He is obliged to propound his theorems baldly and to use his skill chiefly in showing that the facts of experience do not conflict with his propositions. His positive theory of reality is not only uninspiring; it portrays a universe which is essentially dead. There is this vast pool of "experience" which is sensuous and predominantly pleasant in character, in which thought and will are "somehow" absorbed. In

its static self-sufficiency the Absolute lacks the vital characteristics of even our human experience, namely, its transitiveness, its ceaseless forward movement. Human experience is a process in which the perpetual emergence of novelty is a striking feature. It is not so much in a state of static equilibrium as rather toppling forward. Incompleteness and the process of realization rather than the state of complete realization are what is characteristic of human experience at its best, and it is in these that the life of consciousness consists. The Absolute with its impossible completeness is in contrast a dead lump of psychic matter. The worst thing about it is that it is supposed to exist and to be in the end the only thing which exists. Were it an Idea in the Platonic or Kantian sense, a regulative conception, it would perhaps be tolerable, but as fact, as the only fact, it is quite as incompatible with the actualities of human experience as the grosser forms of naturalism.

In this connection the question may well be raised as to whether the psychologism of Bradley does not come to the same result as materialistic naturalism. The spontaneity and autonomy of consciousness are sacrificed to a reality in which our consciousness is absorbed and lost. Whether the pure activity of consciousness is entangled in the net-work of mechanical causation or is sunk in an ocean of "concrete experience" makes no great difference. The pure fact is in any case lost, whether in dead matter or in the equal deadness of the factual givenness of the Absolute. Hence there are important motives of historic idealism which are most inadequately worked out in Bradley. The doctrine of the spontaneity of consciousness is not clearly present. On the other hand, the principle of the priority of the ideal to the real, the doctrine that concrete existence points back to a world of pure thought, to an eternal Logos, is also absent. On these points there is clearly a gulf between Bradley on the one side and Plato and Kant on the other. It is not the biological concretism of Aristotle, however, so much as the psychological concretism of Berkeley, which is, after all, the guiding thought. Now the gulf which separates psychologism from idealism is as wide and deep as any in philosophy. For the former the type of reality is the *psyche*, the being half of nature and half ideal. A more radical idealism, on the other hand, brings out more sharply the ideal principle in man, pure thought, pure spontaneity, and the possibility of apprehending an *ideal world* as the presupposition of the possibility of that actual world which is given to the senses.

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### THE AUTONOMY OF ESTHETICS

THE status of esthetics at the present time cannot be regarded with entire satisfaction. After more than a century of vigorous study its standing as a profitable object of thought, and still more as a real aid to the understanding of its subject matter, is still, on many sides, seriously questioned. Yet genuine interest in it continues to be felt: besides the more inclusive treatments of it we have numerous investigations into the psychological conditions of esthetic perception, many discussions of special problems, and a large amount of incidental comment by the critics and historians of the several arts. Not vet, however, has all this material been brought into a satisfactory fusion, or digested into a body of doctrine ample enough to be authoritative and solid enough to command general assent. It therefore seems appropriate to consider the causes of this condition, and some suggestions for remedying it.

The study of esthetics has, ever since its definite institution, been regarded as a branch of philosophy. The formal instruction in it offered by our colleges is given by the philosophical departments; the most elaborate treatments of its problems must be sought in the works of professional philosophers. This fact, obvious enough, indeed, is not an occasion for unchecked rejoicing. While thinkers of all persuasions have found in the esthetic field a peculiarly convenient or characteristic sample of experi-

ence at large, which they have used to illustrate all sorts of general positions, it is only too evident that such use of the esthetic has often been prompted by its convenience for the needs of a particular system, so that the data are no longer allowed entrance solely on their own merits, or freely and inclusively viewed. The average philosopher approaches them only after the main lines of his position have been fixed, and is accordingly inclined to see them from the angle which that position determines—an angle often limited enough, and at best likely to leave important considerations out of sight. At the same time, the scattered character of the contributions by less technical writers already referred to has made it harder to discern their real value, or to bring them to bear for the correction of the more strictly philosophical positions.

The condition thus created is, I believe, chiefly responsible for the present unsatisfactory status of esthetic study. Those who resort to it for the better understanding or the fuller enjoyment of esthetic experience as such are often puzzled by the discrepancies between what the philosophers tell them and what the observed facts seem to indicate; or, if they turn to work of the other type, they may find it hard to get at, and more suggestive than satisfying when found. With some, the result is the throwing over of esthetic speculation altogether; with others, a somewhat confused attempt to accept the evidence of both sides, in spite of apparent conflict; with still others, a more or less determined effort to revise their esthetic judgments in the light of the chosen position. Consequently, the differences of opinion which legitimately exist with reference to esthetic matters are sharpened by controversies only in part relevant to them and yet pursued with a vigor which only adds to the inherent difficulties of the subject. No doubt this condition may be exaggerated, no doubt there is more common ground than the disputants care to admit; but the emphasis is thrown on the disputed points, rather than on the implied or tacit agreements. When this is coupled with the prevailing tendency to reject any sort of standard or any principle of ordering, it is not strange that some observers should be left bewildered, and others contemptuous.

Those who feel that esthetics is a subject deserving of serious consideration, and who are anxious to do justice to all points of view, can hardly be satisfied with such a situation. They will be fain to ask whether this state of affairs must endure; whether we must either tie up our esthetic experiences to a particular mode of thought, at the risk of limiting or distorting them, or, on the other hand, abandon them to caprice, admitting frankly that they have no relation to a rational view of experience as a whole. I do not think that we are restricted to these alternatives, both undesirable; but the only real remedy must be the establishment of a definite counterview. No compromise, however well meaning, will suffice; we must offer a definite contribution, a firm and tenable position. In a word, we must proclaim and uphold the autonomy of esthetics; and the purpose of this paper is to show, in a general way, how this can be done.

If esthetics is to show its right to autonomy, it must prove that it possesses both a range of facts peculiar to itself, and a definite way of dealing with them. With regard to the first requirement, no serious difficulty appears. Most people seem to agree that objects exist which exhibit the quality called beauty, a quality not identical with truth, or goodness, or usefulness, or pleasantness, however closely it may be allied to any or all of these. We may not agree as to the reasons why certain things seem to us beautiful, or just what traits they usually exhibit; nor will there be exact agreement as to the frequency of beauty in the world about us, some being readier than others to recognize its

presence. But the existence of beauty in some measure will surely not be denied.

When, however, we turn to the second requirement, that of a definite way of dealing with esthetic facts, all hope of agreement may seem to have fled. Some persons assure us that our esthetic perceptions are so dependent on the accidents of our personality, so essentially variable and capricious, that the expenditure of serious thought on them is labor lost. Others, without going quite so far, yet maintain that the ordinary methods of clear thought are too clumsy to deal with such evanescent material, the essence of which evaporates when we try to analyze it. Both attitudes are inherited from the emphasis which for a century and more has been laid on the subjective side of the esthetic experience. We have been constantly assured that the real source of such experience is in its possessor; and since he who has it, or thinks he has it, finds cause for pride in the fact, merely personal preference is given undue weight. Such pride may plume itself on a refusal to appeal to any outward justification, or may support itself by a philosophy supposed to be inaccessible to the ordinary mind. In either case, the vicious circle is complete; interest in the beautiful ceases to be a normal human activity, and is thought of as either the possession of a very few choice souls or the annex of a particular philosophical system.

The obvious way of escape from this dilemma is to deny its necessity. There does exist a large body of thought on esthetic matters, partly the work of philosophers in the strict sense, partly the more casual observations of artists and critics. Even if the former is sometimes too rigid and the latter too cloudy, it seems rather bold to assert that all this effort has been to no purpose; it would seem both more modest and more profitable to assume that a comparison and a cross-checking of the two sides might lead to results which would command more general assent than can be

secured by either side in isolation. Unfortunately, however, there are serious obstacles to the immediate adoption of such a procedure, one of which is the exceeding complexity of the field. We find natural objects and combinations of objects which strike us as beautiful, perhaps to an extreme degree. We find other objects which have obviously been made by man to perpetuate a similar beauty; but we also find objects, equally man-made, which seem to have no counterpart in the natural world. There is thus a realm of natural beauty, as well as a realm of art, and the relation between them is by no means always easy to make out. Moreover, the realm of art is itself complex; there are several distinct arts, each with distinct forms of its own; even the products of a single art may differ widely, and the differences increase as we pass from one art to another. As we continue our inspection, we find that some objects—natural or artistic—yield their beauty readily, that others are less consenting, that some are reluctant or adverse, that some will not yield beauty at all. In short, as we go where beauty is most abundant, not limiting ourselves by any preconceived notion of what it ought to be, we find it distributed over a wide range, and appearing in a vast number of forms. It is equally absurd to think of it as something rare and specialized or as something too simple and easy to deserve much consideration. If some beauty can be drawn in "as simply as our breath." as Rossetti puts it, other beauty is remote and difficult of access: if some beauty is so obvious that we cannot miss it, other beauty is elaborate, or elusive, or highly organized. A strong sense of the complexity of the esthetic field is the only state of mind in which we can advantageously approach its problems.

Once this complexity of the field is realized, we can scarcely wonder that opinions about its parts should be equally diversified. The statement that "there's no dis-

puting about tastes" is usually the prelude to just such a dispute; indeed, we may well ask whether tastes are not really the things most worth disputing over. At all events, we do dispute about them; and if it is to be argued that that makes them capricious and unstable, we might logically go on to say that religion and politics should equally be discarded, because men are not of one mind about them. In other words, the very fact that men argue their esthetic opinions may be taken as evidence that such opinions are worth while. All we ask for them is a fair chance; let the unsound and the unbased by all means be discarded, but let us not, in alarm at any sign of conflict or fluctuation, hastily assume that agreement of any sort is impossible.

The state of mind in which we approach our task seems to me much more important than any immediate attempt to devise a method. If we are to reach any clear notion of why objects seem to us beautiful, of what traits beauty includes, we should surely seek the objects which display the quality most unmistakably, and see them, so far as we can, by and in their own light, without subjecting them to arbitrary requirements and rearrangements. We may then hope that such more general notions as we may frame will grow naturally from the facts themselves, instead of being framed in advance and then applied to or forced upon them. In this way we may hope to avoid the errors which have beset the periods that have conceived beauty in too narrow terms, and have consequently disregarded or denied those manifestations of it which would not fit into their formulas. Such an attitude, however, is not a prelude to a sudden plunge into "the great sea of beauty," with no definite notion of what we are aiming at or where we hope to come up. It is both possible and desirable to mark out certain great divisions, and to suggest what each will yield, before we proceed to a more methodical examination.

It seems fairly clear that the crucial esthetic problems

arise in the realm of the beauty of art rather than in that of the beauty of nature. Questions enough are raised by the relations between the two; but since the ostensible aim of art is to give us beauty in purer and more concentrated form, we can there study its traits more conveniently. But the field of art is itself sufficiently complex. Convinced though we may be that this complexity is based on a unity which justifies us in using the term "art" to include all its manifestations, we are forced to recognize the existence of separate arts, each with its own range of accomplishment, its own contact with experience, its own special problems; so that in each branch of art we find the same division as in art as a whole. Beside these objective differences, there are the parallel differences created by the varying sensitiveness of observers to the appeals of the several arts, a variation obviously in part responsible for the differences in concrete estimates, and for the difficulty of framing a comprehensive theory which will do justice to all the artistic facts. Putting the situation in a nutshell, we have, as the basic problem for such a theory, the reconciliation of an assumed but elusive unity with a manifest and often recalcitrant diversity.

The various attempts to meet this problem have in recent years tended to fall into two great classes, one the method of psychology, the other the method of history. It is natural enough to think that the best clues to the nature of the artistic process can be found by analyzing the mentality of the creator of the work, or of the recipient of it. Unfortunately, however, direct evidence as to the artist's state of mind is by no means easy to get. Many, perhaps most, artists, have not troubled to enlighten us on the point; and the words of those who have cannot always be taken at their face value, even when (as is not always the case) they are uttered by persons really significant as artists. The mentality of the recipient, on the other hand, is of

course more accessible to study; but even there what can be studied most conveniently are the general conditions favoring the acceptance of the simpler forms of esthetic value, rather than the more intense and personal reactions, which cannot be so readily commanded or examined. On the whole, I think, such psychological study has not thrown much light on the deeper problems which concern us, though it has undoubtedly helped us to a better understanding of certain underlying conditions.

If the psychological approach thus seems either too general or too inclusive, the historical approach may seem to promise greater certainty. Any well-preserved group of works in any art can be serially arranged, sometimes with a close approach to certainty, often with great probability; and such arrangement can often be conducted without reference to the identity of the artists, which may indeed not be known. It is undeniable that much aid has been rendered to the better understanding of esthetic values by the historical study of them; but this method, like the psychological, has its definite limitations. It is sometimes forgotten that we need a clear view not only of the surrounding and antecedent conditions but of the work itself; and this is especially true when, as often happens, historical study embarks on the pursuit of origins. The farther back we go, the less abundant does the evidence normally become, until we reach a point where it is largely replaced by reconstruction or conjecture. Again, the traits regarded as most important in the object to be explained may be those most apparent in or best suited to the historical method, not those which are esthetically most significant. In short, the danger is that of trying to explain the better known in terms of the less known, or looking outside for what is really in the object itself. There are gaps enough even in the history of the developed arts; and when we try to reconstruct the esthetic mentality of primitive man, we

have often an immense amount of speculation with a great dearth of solid evidence.

None the less, both modes of approach have contributed to the demarcation of the esthetic field. I believe that our assurance of the unity of art has its basis in the psychological, just as our sense of its diversity has its basis in the historical. The effort to find a common aim in the varied endeavors of artists, the more demonstrable similarity in the conditions under which esthetic values are reacted to. combine to suggest that art is essentially one, however great may be its superficial diversities. But the sense of these diversities is vastly increased when we look at the matter historically, and see how an art has flourished in a certain period or country and declined at another, how what is at one time treasured is at another scorned, how what is lost may by conscientious search and reconstruction be recovered. One point, however, must be insisted on: so long as our interest is primarily in the esthetic aspect, we must remember that both psychological analysis and historical study presuppose the existence of an already embodied esthetic value—in other words, of a work of art. The value of either method depends on its application to an object the esthetic importance of which is already clear to us on other grounds.

Unless this precaution is observed, the autonomy which we are defending is virtually surrendered; but if it is observed, we can point to two devices by which the task of theory may be prosecuted in the two departments. Our only safe point of departure is the esthetic experience as we know it when it is excited by an accessible work; only from that can we profitably study either its psychological or its historical conditions. But once this is settled, we can see that the esthetic situation, psychologically considered, is essentially triadic. On the one side is an experience in which its possessor has discovered an esthetic value;

on the other, an experience into which that value is to be transmitted; between the two, a device by which the transmission is to be effected—in simpler terms, an artist, a recipient, and a work of art. If we hold to this scheme in its simplest state, it enables us to do justice to its components without confusion, at the same time that they are held together in a definite relation. If we study it as actually modified in experience, we find clues to various problems which are much more troublesome if attacked without the help of such a device. It is not possible here to justify these assertions in detail, but it must at least be apparent that in this way psychological analysis of either artist's or recipient's mentality can be kept in close contact with the embodied esthetic value.

If, now, we consider a series of such triads, it is evident that we can draw connecting lines between each set of their constituents. There will be a series of artists, if their identities are known; a series of works, usually further connected by the employment of a similar artistic process; and a series of recipients, sometimes individuals, sometimes grouped into a more or less definite "public." In the first two series particularly we note the fact, already suggested, that the grouping usually proceeds by likeness, painters, sculptors, musicians, or paintings, statues, pieces of music, being taken together, and a definite art accordingly constituted. If we further examine such a series, we find that in some cases it clearly assumes the form of a cycle, rising from obscure or tentative beginnings to a climax of achievement, and sinking into decline or subsidence. This is so strikingly clear in the case of certain periods for which we have extensive information—notably Italian Renaissance painting and Elizabethan drama—that it seems natural to extend it to other periods of which we know less, and to interpret their scantier remains in terms of it. Whether or not it always works, it seems at least the most

promising instrument of order which historical research

can employ.

It is also evident that in practice the two devices of triad and cycle offer each other mutual support and correction. Psychological conclusions, to be worth anything, must be drawn from a considerable range of facts, and this is pretty sure to mean a considerable period of time also, the content of which must, for clearness, be historically ordered. Conversely, after such an ordering, we must call in psychology to help us interpret the significance of the facts revealed. Why, for example, are works or periods which at one time are regarded as having little or no esthetic value later found or thought to have a great deal? Such shifts of taste are frequent, and some at least lead to permanent revision of estimates. The mere passage of time is not a sufficient explanation; there must be psychological factors at work. On the other hand, such a revision may be caused by the discovery of additional data, which open up new ranges of value, or show us some work in a completer setting. Neither psychology nor history by itself can do so much for esthetic theory as will be accomplished by a iudicious combination of the two.

At this point we may conveniently pause to summarize the chief contentions which we have thus far sought to establish. We have shown that esthetics unquestionably possesses a subject matter of its own, if it can make good its claim to control it; and we have seen that the complexity of that matter justifies certain divisions of it for convenience of administration. The simplest such division is into beauty of nature and beauty of art. The latter, examined more closely, is found to possess a unity determined by psychological factors, and a diversity shown by the very existence of separate arts and reinforced by historical study of them. We also possess, in the devices of triad and cycle, definite means of dealing with these two aspects,

which can also be employed in combination. Hence it would seem that an autonomous esthetic, in definite control of its field, is not a dream, but a realizable activity.

It would, I think, be held by thinkers of practically every persuasion that esthetics deals with a certain class of values. This acknowledgement, however, does not oblige us to reach a definition of value in general before we examine the esthetic varieties of it. It is entirely consonant with the position here advocated that we should rather use esthetic value as a means of approach to value in general, thus avoiding some of the controversies which have arisen about the subject. Such a course, indeed, is only another aspect of that abstention from premature philosophical commitments which we have found desirable. If we wait until philosophers have reached complete agreement as to the nature of value, we shall wait a long while. seems quite sufficient to assume that a value is some aspect of a presented situation which tends to satisfy some interest which we feel when regarding it, and that there is no sufficient reason why esthetic values should not coexist with other kinds. It is enough that they should be recognizable, not that they should be in every case pure. More than this we do not need; and so much seems in harmony both with the facts of the case and with the mode of investigation here set forth.

We do, however, need some convenient means of indicating the essential nature of esthetic value, as a guide to its ready detection. After examining a good many of the phrases that have at various times been proposed for this end, I have decided that the most satisfactory is Professor J. Arthur Thomson's description of the root of the esthetic experience as "a pleased awareness of specific arrangements." It has the advantage of fitting well into our triadic formula by emphasizing both the psychological factors and the presence of a definite object, thus rightly implying

that the total esthetic value belongs to the entire situation of which they form parts, not to any single aspect of it. It will then be the business of a developed esthetic theory to inquire what traits in the situation determine such a value, what are the psychological conditions of pleasurable awareness of this sort, and how, historically, such specific arrangements occur when and where they do. We have thus once more indicated the main divisions of such a study, and the means by which they are respectively to be approached.

This mode of approach seems to me to offer fair promise that various perils which have in the past beset the study of esthetics can be avoided. We shall not see one side of the matter so sharply that we can discern no other; we shall not think that a "line-case," hard to classify, makes all general notions futile. To fix our eyes exclusively on such cases is often to puzzle ourselves needlessly; to ignore them altogether in the interest of a supposed ideal is equally productive of misapprehensions. No rational person supposes that any scheme of division or classification will ever be quite adequate to the variety of individual experiences: but that is no reason why we should ignore such distinctions as we can clearly make out, or such groupings as naturally present themselves in the material. The notion of the unity of art must not be made to submerge the differences which the several arts as we have them actually present.

Moreover, the plea that esthetic speculation be at the outset divorced from philosophy of any specific type does not mean depriving ourselves of all rational guidance. We have still left two sources of such guidance: the more or less casual utterances of artists, and of critics who have closely identified themselves with the creative process, on the one hand; and the incidental discussions of esthetic matters by philosophically trained writers who yet keep close

to the facts, on the other. One reason why these sources of information have as yet been imperfectly utilized is the fact that they are widely scattered, often in detached remarks or in uncollected papers, so that many readers remain quite unaware of the amount of such material that actually exists. Merely to indicate the sort of thing that I have in mind, I may mention under the first head the detached but often illuminating thoughts of writers like Joubert and Grillparzer, the critical essays of Pater, the rich and little worked mine of literary theory in the prefaces and miscellaneous writings of Henry James, or, in France, the notable work of M. Albert Thibaudet and M. Paul Valéry. For the more strictly philosophical contributions, we have such things as the letters of R. L. Nettleship, the illuminating discussions of esthetic values and of the relations of art by Professor H. Heath Bawden, and the papers still in course of publication by Professor Helen H. Parkhurst.

The more we utilize material of the two sorts just described, the more shall we minimize controversy for its own sake, and the better shall we realize the existence of common ground. As the critics gradually work their way toward more inclusive views, and as the philosophically minded come closer to the actual esthetic facts, their joint endeavors will tend to meet, establishing points of contact and routes of communication which will produce mutual enlightenment. This does not mean that all difficulties will at once be met, all moot questions automatically answered; such a result, whether or not it be desirable, is assuredly not at present attainable. But much can be done to make clear the real points of difference, and to seek their solution in considerations really relevant to them, as determined by the traits of the esthetic field itself, and not in considerations remote, or even alien. It is just this sort of study that an autonomous esthetic is designed to advance.

The worst foes of such autonomy, as previous experience amply shows, are a desire for undue simplification and a disinclination to think things through. It is easy enough to lay down certain specifications for beauty on the basis of a limited range of esthetic facts, and to hold that whatever lies outside that range is either negligible or definitely unesthetic. When that temptation is reinforced, as it well may be, by insensitiveness to values outside the particular range, the result is bound to be a more or less ossified notion of beauty, such as may be seen in periods which it would be invidious to specify. Of the partial correction of such narrowness by historical study, with its revelation of fresh or neglected values, we have already spoken; but such study is not always enough, for the values thus brought into notice may be more curious than authentic. It is, however, generally true that a renewed sense of the extent of the esthetic realm is attended by a revival of historical study, and that such study is, as we have seen, one of the best correctives of partial or too narrow views.

Unfortunately, no such remedy for the second error is readily applicable. If a person is honestly convinced that esthetic values are either too slight or too elusive to bear careful thinking about, it is not easy to see how he can be brought to change his mind except by a shift of feeling on his own part. Refusal to make such a shift may take the form of flat disinclination to take the trouble, or of a more active pointing out of the confusion and uncertainty which do undoubtedly attend a good deal of esthetic speculation. I hope that what has here been said may incline some of my readers, if they entertain such a view, to look more favorably on the possibility of getting better results; and I do not conceal my own belief that esthetic matters are both as deserving and as susceptible of rational treatment as any others.

Success, however, cannot be hoped for without some

effort. Just as the philosopher finds it hard to do justice to all the aspects of his subject, so the student of esthetics finds it hard to do justice to all the aspects of his smaller field. Between the simplest esthetic perception of the immediately pleasurable and the most complex work of art lies a vast interval, which not everyone may span. Moreover, this interval is not uniform, but is divided into the provinces of the several arts; and since it is a well-known fact that the power to respond to their various sensuous appeals may be very differently present in a single person, it is not strange that very few can offer an adequately responding sensitiveness at every point. Even where there are no such complete barriers as color-blindness or tonedeafness, it is notorious that literary beauty may be keenly enjoyed where music has little charm, or that music may be a passion, and pictorial or plastic beauty a merely curious interest. Thus it requires a certain temerity to propose conditions that profess to apply to the esthetic realm as a whole, and also a certain caution in accepting the testimony of others as to the relative value of the different parts of that realm. The attempt to reconcile these rather conflicting standpoints is admittedly difficult; for too much caution is likely to seem captious, and too great assertiveness runs the danger of being called dogmatic.

It would seem, then, that just as the esthetic theorist may accuse the philosopher of talking about esthetic matters without direct acquaintance with them, so the theorist in his turn is exposed to the attacks of the admirer or of the artist who thinks his favorite art unfairly dealt with, and to those of the "plain man" who thinks all such discussion beside the point. Yet, so long as men are of opinion that art is worth thinking about at all, and so long as some of them cherish a conviction that the different arts have somehow or somewhere a common source or ground, so long will esthetic theory be attempted, claiming a kinship with

philosophy in virtue of its disinterested speculation, and with ordinary life in virtue of its desire to keep in touch with the actualities of artistic effort and achievement, and to make them better understood. The double task is not easy; if it were, it would be the less worth doing. Unless the risks are faced there can be no autonomous theory at all, but surely the trouble is worth taking.

In this plea for an autonomous esthetic theory, therefore, I am not proposing that we cut loose from methodical procedure, or discard any aids to sound thinking, but simply that we adopt a method which promises to avoid the difficulties that are bound to appear whenever esthetic facts are not approached directly. The essential question is, Are these facts important enough to warrant such a direct approach? I believe that they are; and I believe that I have indicated a rational division of the field that they occupy, and devices which can be effectively employed in the study of it. I believe that if we methodically apply these devices of triad and cycle to the psychological and historical aspects of the subject, and if we constantly take as our point of departure the clearest cases of esthetic value that we can discover, we shall reach adequate conceptions of a more general nature, and a better ground for the discussion of more subtle and disputed questions. It also follows that, in consequence of the combined unity and diversity of the field, we may hope on the one hand for a general esthetic theory, and on the other for a group of special theories, one for each art which proves important enough to deserve it. Neither task is simple; and results gained under the first head would always be subject to verification and extension in the light of those of the second. But if both tasks are conducted on the lines here suggested and with the auxiliaries previously mentioned, neither need despair of success.

What, finally, is to be said of the relations of such an

esthetic theory to philosophy in general? If I began by pointing out the disadvantages of their connection as it has heretofore existed, it was not with any intention of asserting that esthetics should forever hold itself aloof from all philosophical contacts. It is obvious enough that the ultimate problems of esthetics must necessarily bring us to philosophy; but I am convinced that the road to that conclusion here indicated is the absolute reverse of that which we began by noting. Suppose that, instead of making our esthetics a mere ornamental annex to our philosophy, we invert the process, and see what approach to philosophy would be furnished by an esthetic theory which should try, as directly and thoroughly as possible, to consider all the relevant facts and their implications before going on to consider what part they have in the wider scheme of things. I suspect that such a theory might profit the plain man by leading him to deeper views of positions with which he is already familiar in their simpler forms, and might equally profit the philosopher by showing him how his categories might be filled in with a more concrete content. In this way it might escape the disadvantages of too exclusive domination by a particular philosophy, might unify the scattered contributions by a more thorough working out of their implicit conceptions, might reveal the common ground that underlies current disputes, and might, in short, demonstrate that thinking about beauty is both a normal and a profitable activity. For my own part, I believe that this is a goal well worth striving for.

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## THE NATURE OF COHERENCE IN AESTHETICS

A NY one moment of human experience is not orderly, but chaotic. If the objects which form that experience could be perceived simultaneously and completely, they would not appear harmonious and orderly, but discordant and unrelated. Thus, what has the noise of a motor car outside to do with the scratching of my pen, or the shining arc-light with the creaking of the veranda chair? Although unrelated by nature and systematically irreconcilable, all these experiences must be dealt with by the organism. A meaning is sought for each object, because toward each man must take an attitude, and because everything that registers on consciousness, however weakly, must somehow be dealt with and disposed of. Yet, how is man, with very limited powers of attention, comprehension, and physique, to deal with the infinitude of events that are occurring simultaneously and within the range of his perception every moment of his life? Some response is demanded, even if it is no more than the unconscious decision to ignore what seems irrelevant. To meet such a demand, all the faculties would have to be ordered simultaneously and harmoniously to each of a variety of conflicting objects in an incomprehensible chaos. Obviously such an adjustment of the organism is impossible. As far as we know, the animal solves this problem by apparently ignoring what is not immediately relevant to his needs. But man has evolved another way of reducing the intolerable chaos of the universe to unity and order, by means of art on the one

hand and philosophy and science on the other. Philosophy and science reduce the chaos to comprehensible abstractions, while art carries on a process of selection and rearrangement for the purpose of producing a desired comprehensible state in which reality may have become almost completely lost.

But why should it be necessary for art to enter at all? Why could not philosophy and science suffice to establish the desired order and harmony in the universe? This paper will suggest, in explanation, that if man's capacity for conscious purposive thought, and his instruments for shaping the universe were adequate for mastering all his difficulties, philosophy and science alone might suffice to establish his adjustment. In the present state, as in all former states, of philosophy and science, after they had been utilized to their limits, much always remains lacking and man's adjustment is never complete. Everywhere, then, art has entered to fill in the hiatus and to attempt to complete the adjustment.

<sup>&</sup>lt;sup>1</sup>F. C. Prescott, in his *Poetic Mind*, suggests the opposite idea, that primitive associative thought is fundamental and essential, and that conscious purposive thought is a later complement which we could well do without. It is easy to agree with him that as man finds rational thought insufficient, he turns to primitive associative thought as the only other means open for completing the work, and that from this arises art. But it is much more difficult to see why he supposes that this form of thinking leads to greater truth and draws from the well of the race's experience. All that can be said is that apparently more people have thought this way, not out of deliberate choice, but because ignorance of science was, and continues to be, the rule, and that what one does not know or cannot yet know scientifically he romances about in the manner most agreeable to himself, and thus creates art. It seems that Prescott's explanation of the origin of artistic activity, which is wholly sound, inevitably leads to the conclusion that art is essentially secondary to science, and that wherever it has been more important it has become so because the inadequacy of scientific progress demanded a complement, and art had to serve because it was the only one. Artistic activity, he says, arises from primitive associative thought, which is employed because rational thought is found to be inadequate. This inadequacy may arise either from the weakness of the mind or from the difficulty of the task with which it is confronted. The mind may be unequal to its task for various reasons. It may be so because it is naturally weak, as in children or savages; it may be so because it is in a state of emotion, preventing the adjustment necessary to attentive thought. The subject also may be too difficult, as almost any subject is difficult for the childish or primitive mind. But many subjects are too difficult for any mind—and they are

Thus art may be regarded as a compensation for the insufficiency of reality. At any rate, artistic activity takes its start, at least, in the creative artist from some such felt insufficiency. Philosophy and science must now be examined to see why it is that after they have treated reality a gap still remains to be filled in by art.

Philosophy is an elaborate logical process that attempts to reduce the many to the one, to give an abstract universal that will link the present experience with the total of all experience. Science has the same end in view. Operating by the elaboration of causal connection, it joins every individual piece with the universe of the past and the present. To establish this connection, science must seek the simplest element common to all objects, which is independent of form, time, and change in general. Therefore atoms and electrons are necessary. Thus, by ignoring form and translating diverse objects into terms of a common fundamental element, philosophy and science establish a kind of order, which, whether true or false, satisfies man because it enables him to bring the chaos into some sort of unified orderly arrangement.

From the operation of science laws arise. But law is not an ultimate being. It is not self-executing; it cannot exist alone. It is response, meaning merely that if A changes, B will change. It satisfies the mind by meeting the logical needs of a situation. Law does not engage the senses, and it is not independent of the things which operate in accordance with it, nor is this accordance immediately perceptible. The accordance and the law itself are arrived at only after a logical process, induction, which interposes

particularly the subjects of art in general and poetry in particular. The mysteries of religion, the meaning of life, the secrets of nature, death, immortality, cannot be approached by the reasoning mind. Here art enters to give at least an obscure total impression. Here, surely, one ought to conclude, as Prescott does not, that art begins where science leaves off and that man resorts to it only for want of something to fill the gap, and not because it is a preferable alternative.

itself as a necessary step between an object and its significance. This is an essential characteristic of science, and the cause of the laborious slowness of its development. A first glance at the heavenly bodies, for instance, would not reveal the orbits which relate them to one another. All we see is only bright spots in the sky. To relate them in a system, we must make very difficult and extensive observations and calculations of their gravitational effects on each other. In the same way, to see a white precipitate formed when hydrochloric acid and calcium carbonate are mixed. would not immediately demonstrate the affinity of chlorine for calcium. Each of the new products would have to be analyzed, and the reactions repeated many times and the effects studied very closely. The immediate preception of the white precipitate resulting from the reaction would in itself mean little with regard to the chemical sgnificance of the change. More would have to be known, and this could be learned only by reference to the accumulated data of a vast science.

For another example, suppose one wishes to understand the chemistry of the combustion of a log of wood. He would have to know the composition of the log, of the air, and the laws of chemistry and physics relating to combustion—clearly a difficult and complicated business. He must have a very extensive alphabet, so to speak, in order to spell out this experience scientifically. But if, by contrast, he says, "The fire is eating the log," that is immediate, intuitive, and practically independent of reference to any experiences other than the very simplest. It is poetry; it is art.<sup>2</sup>

Immediacy and completeness of perception of the significance of things are thus necessary and desirable if a man is to make his adjustment to the environment, and if he is to take a proper attitude as quickly and efficiently as possi-

<sup>&</sup>lt;sup>2</sup>This illustration, though not the application, comes from Prescott.

ble. Philosophy and science work toward this adjustment, but by their very nature they do not at present answer all needs. This is due to the fact that with them the process is not immediate in its results; it is retarded by the intervention of logical induction and by the necessity of discovering and taking into account secondary causes. Here the unavoidable predominance of purposive thought makes the adjustment slow and difficult, a matter of study and comprehension, which is never easy. Reasoning is necessarily laborious and elaborate, and because of this man readily falls back on the imagination, which, depending upon primitive associative thought processes, is easy, immediate, and intuitive, and therefore the faculty of artistic creation.<sup>3</sup>

From this it must not be thought that art is a substitute for the logical realities of science. It is only an addition rendered necessary by the pecularities of the human mind and by the limitations of human knowledge and power. It recognizes that the apparent universe is not the desired one, and so operates as to reconcile the incongruities between the two. Santayana has suggested that all ideas have their origin in inner or outer maladjustment. The ideas of art are, too, a consequence of this maladjustment, but they are different from the other ideas, for art begins where the other activities leave off. It is easier because intuitive and not based upon logical thought, and produces immediately and completely within its own sphere the adjustment which is elsewhere the result of the total activity of rational

³It ought to be made clear at once that whenever artistic creation or experience is spoken of in this paper, what is meant is the process occurring in the creative artist himself, and more particularly in his mind. The subsequent material record of this experience in the form of words, sounds, colors, or forms is important only as an attempt to recapture a fugitive memory. The essential thing is the mental operation that leads to the created artistic object, which may serve the double purpose of satisfying the artist's need of expression and of enabling the beholders to adumbrate—always much more weakly—his experience which is here recorded in its full meaning only for him himself. This makes of the aesthetic experience proper a very personal thing to be found in its purest form in the persons of the greatest artists themselves.

thought. Thus everyone is an artist, but as the technique of expression is rare and difficult, physical embodiment of the artistic experience does not always result.

With the act of perception art seems to create an adjustment which, more than that of nature, philosophy, or science, establishes harmony with human interests. This is due to its immediacy, completeness, and independence from all extraneous considerations such as truth and practical utility. But in addition to these essential qualities, art may have a variety of incidental qualities that are of no aesthetic consequence. It is often interpenetrated by outer interests. Thus, the pictures of Uccello, who in 1305 gave himself fanatically to the study of the new science of perspective, may have meant to him consciously only so many feats in foreshortening and experiments in perspective. Similarly, the modern Dadaist may see in his paintings a philosophic device for overthrowing an unsatisfactory civilization. But in each case, if the works possess the required immediacy, completeness, and independence, they are genuinely artistic, despite the artist's expressed scientific or philosophic intention.

If it is the aim of philosophy and science to remodel discordant nature into harmony with human nature, as it is the aim also of art, wherein lies the difference? It lies in the acknowledgment by the arts of the value of immediate experience and feeling, however induced, without reference to or the sanction of practical reality. It accepts experiences and desires as they come, in and for themselves; eliminating, adding, and rearranging the materials that can best represent the desired values in concrete terms of sense. This process, as will appear in the development of this paper, depends upon the predominance in art of the more primitive process of associative imaginative thought, as contrasted with the purposive rational thought of science. What follows here will be a detailed examination of the

distinguishing peculiarities, so far only named and barely characterized, which separate art from other activities.

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It is first to be noted that art employs, at least as a starting-point, matter, and deals with materials which have been apprehended through the senses and which manifest themselves in the memory. But it must be added that in art these sensory images or memories are dealt with in a peculiar way. They are not arranged at all by reasoned thought, but by more or less spontaneous association, which is a way of liberating experience from scientific laws. Rational thought is more directly related to sensuous experience. It is carried on while the senses are active, and deals with the materials they immediately furnish. Primitive associative thought, however, depends more on sense memories, and is most effective when the senses are not vividly alert. To this end revery, dreams, alcohol, narcotics, falling in love are recommended, because they relax the attention to life and permit a free and unimpaired arrangement of imagery to meet the peculiar and personal needs of the artist. In some such condition lies poetic madness or vision.4 Shelley, for instance, composed best with his head close to a fire or in the heat of the Italian sun. And the use of narcotics by many artists, such as Coleridge and De Ouincy, is universally understood. At any rate, the important thing here is that before aesthetic experiences can occur, particularly those associated with the creative process, the artist must by natural or artificial means induce a reversion to imaginative thought, as contrasted with rational purposive thought.

Immediacy, completeness or independence of the practical realities of the environment, and a use of the accumulated sensory data have been indicated as the characteristics of art. The immediacy and completeness arise from the

<sup>&</sup>lt;sup>4</sup>F. C. Prescott, Poetic Mind, p. 66.

internal activity of composition, which so selects and arranges the parts that they form for the artist, even if for no one else, a unified whole, free from conflicts and irrelevancies, and likewise liberated from the necessity of making external reference, which is so essential to science. These characteristics endow the creation with independent unity and coherence. Such coherence, realized by means of a process of unhindered arrangement, is the fundamental ingredient of art.

From this we can define coherence as that which gives to the artist an immediate perception of the mutual interdependence of the parts of his composition, without reference to the past or the future, and without reference to causal connections or to external scientific laws. This would allow aesthetic qualities to that which violates natural laws, as a shadow on the wrong side of a house, or a human figure with wings, or a Medusa with snakes for hair.

Immediacy, the first of the qualities which go to create this coherence, appears most clearly when contrasted with scientific phenomena. We have seen that in science things win significance not directly in and for themselves, but through the mediacy of an intervening law, which it is the business of science to discover. The establishment of such a law is a deliberate selection from the chaos of experience. No particular object means anything unless it can be referred to many others and to laws. But in art all that is not immediately given and apprehended does not belong at all; it is ignored as irrelevant. A specific example will make this clearer. A scientist seeing a sunset understands by means of the laws of refraction why the sun looks bigger and redder and knows that its apparent drop is due to the motion of the earth and not of the sun itself. All this is scientifically true and valuable, but entirely indifferent for apperceiving the sunset as it appears to us. The primitive savage who says that it gets gorged with blood as it drops

in the heavens and that it sinks and is extinguished in the cold blue ocean, is aesthetically the more truthful, because he is giving that which we really do see immediately and without the necessity of reference to external laws.

Completeness resulting from the felt interdependence of the parts is the second aspect of aesthetic coherence. The artist feels, without the necessity of reason, that these parts do properly and of right belong together; the arrangement satisfies him. This leads to a stronger attention to the beautiful object than is given to ordinary things, and so engrosses the artist in the resulting train of associative imagery that all other considerations are excluded, even the self of the observer. One can, for example, become absorbed in a painting by Van Gogh of an incandescent Provencal sun, but not in the sun itself, were its rays burning down on one's bare head. The painter was able to tolerate the sun, as perhaps another could not, because he was rendered oblivious to it by the train of associative imagery which it set in motion. Also his attentive effort to reproduce this imagery on canvas helped to engross him. Should another expose himself to the same sun, it is more likely that he would be conscious only of the heat and discomfort than that he would experience Van Gogh's train of imagery, launched, so to speak, by the sun, and reproduced on canvas by the artist. By means of the painting, with its sweating laborers and drooping oxen that may not have actually been on the field at all, others can, but to a very much less intense degree, understand something of what the molten vibrancy of that sun meant to Van Gogh. The sun as a cause of distracting discomfort is now removed by the artist. This is, so to speak, an artificial aid to the observer, whose reaction, if he saw the sun itself, would lack Van Gogh's emotional coloring to neutralize the discomfort. Nor could it mean the same, or as much, to him, because he could not bring to

it Van Gogh's particular experiences.

This indicates why the absorption which excludes all externality is so important in art and why it is so much more intense in the artist than in any observer of his works, and it gives ground for the insistence on the purely personal nature of the aesthetic experience. It is in the nature of the case that only one person, the artist, should experience it most intensely and most nearly completely. It is in the phantasy, the dream, or the free associative process—set off by whatever external stimulus you will—that art lies. Furthermore, the representation is not important. It has to do with another activity, the desire to express one's self. At best the representation is only an imperfect embodiment, and that is why the artist is so rarely fully satisfied with his work. These considerations indicate that by the use of mere abstract symbols, as in music, the artist might more satisfactorily to himself succeed in setting down his thought. Modern pictorial art has taken this path; but its weakness is that as the symbols lack intelligibility, the work will mean little or nothing to the observer, though to the artist it may be rich in meaning.

The essential fact here is that in the aesthetic experience the necessary engrossment in the primitive thought process and the obliviousness of the external world, are a result of the innate and thoroughly satisfactory coherence of the parts. For the time a completely desirable world has been established, without a discord. The artist experiences it automatically at the chance occurrence of a given stimulus, the sight of a person or a cloud, the sound of a wind, or the odor of a flower. The resulting desire to incarnate the train of associative imagery which follows the original stimulus is an incidental piece of good fortune for other people, who, given the composed and artificially isolated work of art, may attempt to adumbrate the artist's experience if there is any common ground between them, and, happily,

there is often a great deal. The fact to be observed here is that this inner agreement is the deepest characteristic of everything aesthetic, and is quite different from the unity of causal connection to be found in science; and that in its purest form, namely in the artist, it springs from a process of primitive associative thought that is initiated by a stimulus.

Thus we see that just as science connects, so art isolates its materials; and just as science requires the aid of causal interconnection and laws which postpone the perception of immediate relationship of things, so art operates immediately and independently of outside considerations. Consequently the simplification of science is a slow, laborious process, connecting an object with the universe of the past and the future; while art is a facile and immediate process which creates a self-sufficient object detached from the remainder of the world.

There still remains the question of why the experience of the peculiar coherence which has been here described and characterized as the essential of aesthetic activity should have value for us. If we remember, however, that significance is of necessity sought for each object in the environment, so that the organism may take toward it a satisfactory attitude, for the sake of survival, and that man has two mental processes by which to effect this, we may get a clue to the particular value of aesthetic activity or coherence. Man has only a limited amount of power and so can accomodate himself physically to a strictly limited number of objects at one time. He is therefore obliged to select and reject, in a word, to compose his world, in order to establish some kind of comprehensible unity and coherence. In this way he finds a cementing principle to bind together a diversity of objects and to make them intelligible as a group. When he becomes aware of this intelligibilty, all his faculties can then take an integrated attitude, just as they do automatically toward food or danger, which merely happen to be more urgent and fundamental than the others, and therefore have developed a readier and fuller response. In art, as contrasted to science and philosophy, this cementing principle is more easily and quickly established by the primitive association of images, which, being already innately unified and related, automatically and unconsciously eliminate all inharmony.

Therefore, art can be said to possess a survival value. related to, but less important than, biological activities, like food-getting.<sup>5</sup> The extreme function and value of art lie in such a statement as when we speak of realizing our wildest dreams. This explains the paradox that while art grows out of biological roots, its value increases as it roams farther and farther away from biological reality. This suggests, too, that as our wildest dreams tend more and more to become realized by science, the necessity and value of art will suffer a corresponding decrease. Science constantly encroaches upon art in this way, and may eventually completely supplant it. There seems to be some evidence of this already. We are more impersonal and less poetic toward a sunset, now that we no longer have reason to entertain such myths as that a monster swallows the sun each night, or that it is driven up in a chariot each morning. With the development of aviation, the poetic possibilities in the flight of birds will be considerably diminished. With ampler food supplies and better distribution, Isaiah would never have sung as he did in xxix, 8, "And it shall be as when a hungry man dreameth, and, behold, he eateth . . . . or as when a thirsty man dreameth, and, behold, he drinketh." In the case of eunuchs, it may be properly said that as science has closed one avenue of desire, it has also closed one avenue of artistic expression, in the form, let us say, of love poetry.

<sup>&</sup>lt;sup>5</sup>Less important than food-getting, because an aesthetic experience of poor quality, or the complete absence of all aesthetic activity, would hardly be as fatal to human life as the absence of food or the presence of wild animals.

It is inconceivable that unfulfilled sex desires, which are recognized as a dynamic source of art in normal people, should ever lead a eunuch to write such lyrics as Robert Burns wrote when separated from his mistresses.

Primitive man thought mostly in images, and hence lived largely in the imagination. But imagination is called upon to do less as reasoning and science become stronger. This has been recognized; Macaulay, for instance, asserting that "as civilization advances poetry almost necessarily declines." Thus with the development of analytic thought and science, the problem of adjustment will be more and more rationally solved, so that fantastic thought will tend to become less and less necessary as a complement. If science should discover a way to prolong life indefinitely, man would probably lose his interest in religion and other poetic conceptions of immortality. But it is quite conceivable also that with the satisfaction of each new demand, man would will and imagine something still different and newer. In that case there would be an infinite development of science, paralleled by an infinite procession of unfulfilled desires, which would pass from the realm of art to that of science as they each became realizable.

As long as there will be unsatisfied desires, whether old or new, the function and value of art will remain the same, because through it, by means of facile associative thought, we enjoy a lulling substitute for the abilty to control nature instantaneously and at will. And its value becomes the greater as it gives us combinations which, because of the peculiarities of artistic coherence, tend more and more toward the unreal.

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<sup>&</sup>lt;sup>6</sup>The artist seldom or never merely describes nature. He inevitably beautifies and glorifies it—diverts it from reality. The moment he modifies he does so not at random, but in accordance with his desires. Instead of describing the present reality, he looks through his desires to the one hoped for.

## PLATO'S THEORY OF BEAUTY

IN E DO NOT find any conscious reflections upon the nature of beauty in extant Greek literature before Plato and Xenophon, that is before Socrates. But the sense of Beauty was always the distinctive quality of the ancient Greek, and if we wish to have a clear idea of the aesthetic experience of Plato's contemporaries, we must turn to Homer. There we find that the word "beautiful" refers primarily to the beauty of the physical world, i. e., beauty as seen by us, and especially the manly beauty of the youthful hero who is, as Priam says, always beautiful, even in death. The beauty of nature is not ignored, but references to this occur most often in metaphors or similes, where the chief interest is still centered upon the human actors. Nature to Homer, as to the Greeks in general, is but the frame, with man as the picture. Of moral beauty we find little, and even where certain actions are called beautiful, they are considered aesthetically) Homer's attitude may be best expressed in the words used by Santavana: "Where the absence of these virtues (i. e. honour, truthfulness and cleanliness) causes an instinctive disgust, as it does in well bred people, the reaction is aesthetic, because it is not based on reflection and benevolence but on constitutional sensitiveness."2 Where

<sup>&</sup>lt;sup>1</sup>Iliad, XXII, 71. Perhaps the nearest approach to a definition of "beautiful" that we get in Homer is his description of the natural beauties of Calypso's isle, "even an immortal god who came there would wonder at the sight and rejoice in his heart."

<sup>&</sup>lt;sup>2</sup>The Sense of Beauty, p. 31.

Homer says of an action that it is "not beautiful", he means that a breach of this rule is ugly, in so far as it causes pain to the spectator.

In the same way, where works of art or songs are called beautiful, it is especially their spectacular value that the

author has in mind; not their moral value or their technique.

Such is the sense of beauty in Homer, and we must remember that every young Greek was taught to look upon the Iliad and Odyssey not only as an artistic heritage, but

as a moral and spiritual guide.

It is in the lyric poets that we first find the moral aspect of beauty emphasized. In this they were followed by the tragedians and philosophers. The word καλός comes to be used more loosely and the distinction between the good and the beautiful is obscured. It is interesting to note that the adverb καλῶς, which occurs only once in Homer, is now used as much and with as vague a meaning as our own adverb "well", and that phrase καλὸς κάγαθός, beautiful and good, now comes into fashion as the ideal Greek gentleman. We shall see that it remained Plato's ideal to the end. This tendency to identify Good and Beauty, which is completed in Plato, was a natural result of Greek humanism, and it led to the further identification of Beauty and Usefulness, for throughout their literature, from Homer downwards, the Greek conception of Good was strictly utilitarian. Nevertheless even in fifth and fourth century Athens. the average man did not keep pace with the meditations of poets and philosophers, and he continued to use "beautiful" more in the Homeric sense.

Traces of this popular usage are not wanting even in

<sup>&</sup>lt;sup>3</sup>For numerous references, see J. Walter: Geschichte der Aesthetik im Klass, Altertum, (1893) pp. 18 ff. and notes. He also works out in detail the development of the useful or moral aspect of beauty in Greek thought.

<sup>4</sup>In Odyssey, II, 63.

Plato. The conception of the beautiful as useful had affected the average mind only to the extent of preventing obviously harmful things being called beautiful. From the point of view of aesthetic reflection, we must distinguish two periods in the writings of Plato. In the first, to which belong the Gorgias and the Hippias Major, he attempts to explain and crystallise the common aesthetic experience of his day. In the second he develops his own ideas of beauty, but without in any way rejecting the results previously obtained. The most important dialogues of this second class are, for our present purpose, the Republic, the Phaedrus, and the Symposium, the Philebus and, to a certain extent the Timaeus.

Socrates, in the *Gorgias*, in the course of an argument to prove that it is better to suffer wrong than to do it, defines a beautiful thing as that which either is useful or gives pleasure to the spectator (i. e. to the person who sees or hears it.) This definition is accepted without discussion and the argument proceeds. So far we have two causes of beauty, usefulness and pleasure.

The Hippias Major is a short dialogue of which the purpose is to make clear the fundamental ignorance of Hippias of Elis, the great sophist who boasted to be an expert in all departments of knowledge, by showing that he cannot even give a satisfactory account of such a simple thing as beauty. The Platonic authorship of the little work has been doubted, but without sufficient reason. Socrates first rejects three suggestions of Hippias, namely that beauty is: (a) a beautiful maiden, (b) gold, (c) a happy life, prosperous and beautiful until death. In discussing these proposed definitions, Plato has an opportunity of explaining in detail the

<sup>&</sup>lt;sup>5</sup>Such as the difference between καλός and καλὸς κάγαθός in Lysis 207 a; see also Ion, 530 b; λαμπρότατον ίδεῖν καὶ κάλλιστον, Timaeus, 40 a, (most shining and beautiful) of fire and the frequent use of καλός of phyysical beauty, e. g. Phaedrus 237c, 238c, 243c.

<sup>•</sup>Gorgias, 474, d-e.

difference between particular examples of beauty and beauty in general. But it is the latter part of the dialogue which is especially important for us. Socrates here suggests three definitions of beauty which, for the sake of politeness, he puts into the mouth of an unnamed speaker who is no other than himself. Beauty is (a) the suitable or fitting (τὸ πρέπον); (h) the useful (τὸ χρήσιμον), which is then restricted to what is useful for a good purpose, which we will call the advantageous (τὸ ἀφέλιμον); (c) the pleasing to eye and (or) ear (τὸ δί' ὄψεως καὶ ἀκοῆς ἡδύ). None of these definitions is accepted and the Hippias Major ends without answering the question, What is the beautiful? But it clearly enunciates three aspects of beauty which Plato, in all his further discussions of aesthetic experience, will attempt to reconcile. In the last two definitions, the advantageous and the pleasant to eye and ear, we recognize the two parts of the definition given in the Gorgias, but with a difference. Not only are they more completely explained, but each is examined in turn to see whether it can account for all beauty, i. e. whether we can reduce beauty to a single conception, a common quality, corresponding to the common predicate and justifying our calling beautiful all those different objects and actions to which, as a matter of fact, we do give that name.

So far Plato is only giving expression to the common Greek feelings about the beautiful. It is important to note that in neither of the two dialogues referred to does he make any use of the theory of ideas. Not a single expression either in the *Gorgias* or the *Hippias Major* need imply that Beauty has any existence of its own apart from the particular objects in which it appears. Not so in the *Republic*. There Beauty is, like Goodness, Justice and the like, a fully fledged Platonic "idea". It has left the world of becoming

<sup>7</sup>Hippias Major, 293e; 295c-296e; 297e ff.

to inhabit that of Being or Reality. As such, it is apprehended by the mind, and the beauty of which our senses are aware is but a vague reflection of it. We had already been told in the *Hippias Major* that any beautiful particular is only relatively so, just as a beautiful maiden, when compared to a goddess, may equally well be called ugly. This is again emphasized in the *Republic* where it is proved that all so-called beautiful things are also ugly. This much even the man who fails to apprehend absolute beauty is compelled to admit. The philosopher, with the aid of knowledge, apprehends that absolute beauty which dwells in the world of Reality and is the only true beauty, for it is the only beauty that can be known. The beautiful phenomena, on the other hand, being in a world of change and flux are the objects of opinion, not of knowledge.

But that ideal Beauty still manifests itself under the same aspects: suitability, advantageousness and pleasure of sight and hearing. Plato develops each of these in his works and in tracing that development there is in each case an obvious tendency to lead beauty away from the senses to the intellect.

(a) The fitting or suitable is not defined in the Hippias Major, as the advantageous is. Indeed, Plato does not seem to be at all clear what is the difference between the two. When he tells us, for example, that a ladle of figwood is more suitable than one of gold both because it gives a better flavour to the broth and is not likely to crack the turreen, it is clear that these reasons also make the figwood ladle more useful. But although he does not express himself clearly here, by "fitness" Plato must mean harmony, which he often refers to as a cause of beauty elsewhere. And the perception of harmony means the perception of unity in variety, of the one in the many which has been called "the

<sup>&</sup>lt;sup>8</sup>Hippias Major, 289a.

Republic, 475a-479e.

one true aesthetic principle recognized by antiquity in general." How close this connection between harmony and beauty seemed to Plato can be seen from the number of times the two are used almost synonymously. They are said to be identical in the Symposium, and in the Philebus measure is that which through its admixture with the indefinite substratum, produces both the beauty and strength of the body and the superbeauty (παγκαλά) of the soul.

It was an easy step from harmony to measure, for to Plato harmony meant moderation. Justice, which we are told elsewhere is always beautiful. is understood throughout the *Republic* to mean moderation and self-control, both in the individual and in the state. Each constituent part of the soul or state should find the place for which it is suited and keep to it. So in the *Timaeus*, which is written under Pythagorean influence, measure or number is the only thing that makes knowledge and time possible. The sun and the stars have been created for that purpose, for without them there could not be time. To possess intelligence or reason is to share in or apprehend number.

Although Plato nowhere gives a full account of his aesthetic, the conclusion is clear. Thanks to the presence of measure or number working upon the indefinite substratum, the universe is a harmony. This ordering of the cosmos through number accounts for the beauty of the world—it is Beauty itself. For Plato never questions the beauty of the world.<sup>15</sup> Truth and Beauty are thus found to be two aspects of the same reality, and inseparable.<sup>16</sup>

Neither does the beauty of man depend on the soul

<sup>&</sup>lt;sup>10</sup>Bosanquet: History of Aesthetic, p. 30. For beauty as "suitability" see Plato, Alcib. I, 135b, c; Aristotle, Topica, 135a, 13 and Nicom. Ethics, 1122b, 8f; also Homer, Iliad, XXII, 79; Odyssey, VII. 159, etc. The importance of "Harmony" in Pythagorean philosophy is well known.

<sup>&</sup>lt;sup>11</sup>Sympos., 206d.

<sup>12</sup>Phil., 26a-b.

<sup>&</sup>lt;sup>13</sup>Laws, 859d. ff. on the identity of justice and beauty. <sup>14</sup>Timaeus, 38b. ff.; see also Epinomis, 977c.

alone, or the body alone, but upon the harmony of both. The following passage is a timely reminder that Plato never lost his sense of proportion. The "beautiful" man must take care of both body and soul:<sup>17</sup>

"All good is beautiful, and beauty is not without measure. If we are to attribute this quality to a living creature, it must have measure. We perceive the smallest kinds of "harmony" and remember them, but the greatest and most powerful we neglect to compute. For no "harmony" or discordance is more powerful to effect health or illness, virtue of wickedness, than that between the soul itself and the body itself. This we altogether fail to see or understand: that when a soul that is strong and great in every way has to rule an inferior body, or vice versa, the whole creature is not beautiful—for it lacks the greatest harmony, but the creature that is in the contrary state is, for him who has eyes to see, most beautiful and lovely."

(b) The main difference between the advantageous and the fitting is that, while the latter is complete in itself, being a relation between two objects as perceived by a subject, the former has an end in view, namely the Good. But a study of this aspect of beauty led Plato in a similar direction as the first. This second definition is rejected for a curious reason, which Plato apparently believed to be sound. If, says Socrates, the advantageous is the cause of the good, it cannot be identical with the good, which we know it is, for the beautiful is good. The idea of beauty as "the father of the good" is a notable one. The *Hippias Major* was written at an early stage in Plato's life before the use of the predicate, i. e. the difference between: "Beauty is good", and "Beauty is the Good", was clearly understood. The question of the copula is dealt with in the

<sup>15</sup> Timaeus, 29a.

<sup>16</sup> Philebus, 65a.

<sup>17</sup> Timaeus, 87c. ff. The word I have translated harmony is συμμετρία.

<sup>18</sup> Hipp. Maj., 297c.

Sophist after which the Hippias Major could not have been written.

That beautiful means useful is frequently stated, both by Plato and Xenophon.19 It appears then to have been accepted by Socrates. But it is probable that his shrewd common sense led him to see the inherent difficulties of this theory. As he says in the Symposium of Xenophon,20 if beautiful eves are those that see best, then his own eyes are more beautiful than those of Critobulus because they project further out of his head and have therefore a wider field of vision. Ouotations from Plato could be multiplied from almost all his dialogues to show how deeply the usefulness of beauty was rooted in his mind. Even in the Symposium, where it has been said that Beauty is the ultimate object of desire and thought, we should not forget that love has not Beauty for its ultimate object but creation in Beauty.21 This conception remains with Diotima throughout her speech. The child of Beauty and Love is virtue. When in the Timaeus<sup>22</sup> Plato says that the most beautiful bodies are the isosceles right angled triangle and the right angled triangle which is half an equilateral, he is not thinking of these triangles as being the most aesthetically pleasing but as being capable of the most varied combinations, and thus the most useful to the Creator.

It is this view of beauty which is directly responsible for Plato's views of art in the *Republic* and the *Laws*.<sup>23</sup> The value of artistic achievement is to be sought, we are told, in its effect upon men. It is beautiful in so far as it makes them better. It would be an advantage if it could be stereo-

<sup>&</sup>lt;sup>10</sup>Xen., Memor., III, 8, 2-8; IV, 6, 8-9. Plato, Rep., 402c; Phil., 50b; Timaeus, 31€; etc.

<sup>&</sup>lt;sup>20</sup>Nep., Symp., V, 5. Note that "eyes" are the first example quoted to prove the usefulness of beauty in *Hipp. Maj.*, 295c.

<sup>&</sup>lt;sup>21</sup>Symp., 206 c and e.

<sup>22</sup> Timaeus, 53e.

<sup>&</sup>lt;sup>23</sup>Rep., 377b-403c; and 607ff; Laws, 655 b, ff.

typed like that of the Egyptians.<sup>24</sup> Being purely didactic in purpose it must avoid all excess and must only imitate those sights and actions which will make men better. Should the artist refuse to comply with these regulations we must bow him out of the state. This crude utilitarianism is shown best in the *Lysis*<sup>25</sup> where Socrates says—quite casually—that no one would of course consider himself a good poet if his poetry brought him harm, although we must remember that to Socrates, the man's own good and that of others was identical.

We have here then what is often attacked under the name of "the moralistic fallacy" in art criticism. "The moral and practical judgment," says Bosanguet,26 "is the first intellectual outcome of practical life, and is inevitably turned upon the world of beauty, so long as it is undistinguished from the objects which constitute the means and purposes of real action." But it is a bold statement that separates the world of Beauty from that of real action, whatever the latter may be, and Plato is right at least when he says that the Good and the Beautiful cannot be incompatible. As Dean Inge has said:27 "Plato would banish all poets who are not edifying: his test of good music is its effect upon the moral character. This confusion of two standards undoubtedly led the Greeks, and perhaps Ruskin too, into some errors; but the ultimate identity or at any rate perfect harmony of the good, the true and the beautiful, is an article of faith which will help a critic more than it hinders him." There are things that are banished from the stage by common consent at all times. The difference between Plato and us is only one of degree. Ultimate harmony of Good and Beauty is all that Plato claims. Just

<sup>24</sup> Laws 817b.

<sup>25</sup> Lysis, 206b.

<sup>28</sup> History of Aesthetic, p. 18.

<sup>27&</sup>quot;Ruskin and Plato," in Ruskin the Prophet and other Centenary Essays, 1920.

as the four cardinal virtues, courage, moderation, wisdom and justice are different and yet cannot be separated from one another, in the same way Beauty and Good are one and yet many. We cannot conceive or explain the Good, except in terms of Beauty, Measure and Truth, says Plato in the *Philebus*. And we have seen that Beauty and Measure or Harmony are usually spoken of as identical. There is an interesting passage in the same dialogue, where Plato speaks of absolute beauty in the following words:

"I am now trying to explain to you a beauty of forms which is not what the majority would interpret it to be, namely that of living creatures or of pictures; I mean something like the straight or the circular, and the planes and solids that are made by means of them by lathes and rulers and instruments to measure angles. These things I say are not beautiful in comparison with something else, but they are in essence beautiful always and absolutely, and give certain pleasures of their own, which have nothing to do with the pleasures of scratching; and there are colours which are of the same kind. Do you understand?"

By "pleasures of scratching" Plato contemptuously refers to physical pleasures. The expression I have translated by "in comparison" with could, in another context, mean "with some ulterior end" ( $\pi \varrho \acute{o} \varsigma \tau \iota$ ). But that would give altogether the wrong sense. Plato does not mean that these "forms" have no other end than beauty, as for example that they do not lead to good, as he quite clearly says a little later that the pleasure provided by the contemplation of these "forms" ( $\sigma \chi \acute{n} \mu \alpha \tau \alpha$ ) do lead to good. He is contrasting their beauty with that of the phenomena. By

<sup>&</sup>lt;sup>28</sup>On the unity of virtue, *Prolagoras*, passim; also *Laws*, 966a—where they are compared to Good and Beauty.

<sup>&</sup>lt;sup>29</sup>Phil., 65a.

<sup>30</sup>Phil., 51c.

"form" he means the concept circle which does not vary whereas particular circles or lines undoubtedly do. Any particular phenomenon is no more beautiful than it is ugly, and a fairly well drawn circle is beautiful in comparison to a worse and ugly when compared with a better drawn one. No particular circle is perfect. But what we see in circle and what gives us delight is the beauty of the circular form which is always beautiful wherever it occurs. These forms are somehow intermediary between the particular phenomena and the supreme ideas, in the "line" in the sixth book of the *Republic*. Plato implies for "forms" what he definitely states of sound: that the most simple are the most beautiful <sup>32</sup>

That is doubtless a reflection of genuine aesthetic value. But Plato's reason for this statement probably was that the simplest things are the basis on which the rest are built. Just as the simplest "forms", the two kinds of triangles in the *Timaeus*, are the most beautiful because they are the most useful in constructing other figures.

(c) Beauty is what is pleasant to eye and (or) ear. This is the third definition suggested in the *Hippias Major*. Its importance lies in the fact that it is a hedonistic view of beauty, and an advance upon Homeric beauty which nearly always appeals to the eye only. It is rejected because Plato fails to find in what these two kinds of pleasure are different from all the others. In other words, he fails to discover why they, and they alone, are beautiful. He comes very close to his later theory of the "pure" pleasures when he suggests that they are the most harmless. But confusing, as he frequently does in his early writings, the negative and the contradictory, he takes harmless as meaning advantageous, and the objections made against the second definition are then valid once more.

<sup>81</sup> Phil., 54d.

<sup>32</sup> Phil., 51d.

The problem is solved in the *Philebus*.<sup>34</sup> Plato there divides pleasures into pure and impure, the former being the beautiful pleasures. By "pure" he means pleasures which are unmixed with pain. Drinking is an impure pleasure in this sense, because the absence of it, i. e. thirst, is painful, but the pleasures of sight are pure because the absence of them is not accompanied by pain. The characteristics of the pure pleasures, which are also the beautiful pleasures, are that (a) they are free from pain; (b) they are caused by things beautiful in themselves; (c) which are always beautiful; (d) they are moderate (lit. have measure). They include the pleasures of sight, those of hearing, most pleasant smells, and the pleasures of the intellect.

There is a similar division of pleasure in the *Republic*, where Plato is proving that pleasure and rest from pain are not identical, although the majority of men not unnaturally confuse the two. The sense of smell is again brought forward as proving the existence of positive pleasure, as not being preceded by pain. The most pure, and therefore the most real, pleasures are those of the soul. These are practised by the philosopher, and his life is filled with the best and truest pleasures.

It is while discussing the hedonistic aspect of beauty that Socrates says to Hippias: "Everybody would laugh at us if we said that eating is not pleasant but beautiful, and that smelling is not pleasant, but beautiful. And all men would maintain against us that the pleasures of love are the most pleasant of all, but that if anyone practises them, he must so do it so that no one sees him, as being most ugly to behold." The idea that anything for which man requires

<sup>&</sup>lt;sup>33</sup>*Hipp. Maj.*, 303e.

<sup>84</sup>Phil., 50d ff.

<sup>85</sup> Rep., 583b-587b.

<sup>&</sup>lt;sup>36</sup>Hipp. Maj., 299a. A similar confusion occurs in a different connection in Gorg., 475b.

privacy is necessarily ugly rests on a confusion between the feelings of the actor and those of the spectator. A poet seeks to be alone to write his masterpieces, yet it is not displeasing to see a man writing verse. A different confusion is found in Philebus<sup>37</sup> where Socrates says: "When we see anyone enjoying pleasures, and those almost the greatest, realizing that they are attended by ridicule and shame, we ourselves are ashamed and hide them as much as possible, practising all these by night, thinking that daylight must not see any of these things." Here the feelings of the spectator are mentioned, it is true, but only his sense of shame, not his aesthetic appreciation. This shame is really sympathy with the victim. We know that he will dislike being seen and feel awkward in consequence. The truth is, of course, that the desire one may have to be alone to enjoy certain pleasures of love or art has nothing to do with the aesthetic value of the act. This should be judged on its own merits.

Suitability or Harmony, Good or, more strictly speaking, the cause of Good, the "purest" of pleasures: such are the three aspects under which Beauty appeared to Plato. But how was it to be approached? In what way can we hope to apprehend it?

To Plato, both aesthetic satisfaction and the student's longing for Truth were parts of Love. Love has for its object Beauty, or rather, as we saw, Creation in Beauty. This sublimised love is described in the *Phaedrus* and the *Symposium*. The first of these two dialogues, in which we may see a strong tinge of Orphism, depicts the soul, before it is imprisoned in a mortal body, striving to follow the gods in their course and to catch at least a glimpse of the ideas which have their being outside the world of becoming. If successful they behold Beauty, Truth and Goodness, and this sight causes the wings of the soul to grow.

<sup>37</sup>Phil., 65e-66a.

But there is such a crush and confusion of souls competing for a place in those higher regions that many lose their wings, and are filled with evil and forgetfulness. But even on this earth the best of them seek to regain that vision which they have lost, and these are the philosophers. The function of Beauty as expressed by the phenomena is to remind us of the absolute beauty we have imperfectly seen, and the lover of beauty feels his wings growing once more, at the sight of this reflected beauty, wings which will lift him again into the sight of beauty itself, and rejoices. But everyone loves according to his character, which is modelled upon that of the god whose follower he was while journeying on high.<sup>38</sup>

This upward journey is fully described in the Symposium: 39

"For," says Diotima, "one who follows the right path must begin as a young man by going to beautiful bodies, and first if he is properly led, he loves one body and from this he gives birth to fine thoughts, then he sees that the beauty of any one body is sister to that of any other and that, if he is to pursue physical beauty, it is great foolishness not to believe that the beauty we see in all bodies is one and the same thing. When he understands this he is the lover of all beautiful bodies, but he abandons that violent desire of a particular one, despising this and thinking it of little weight. Later he considers the beauty of the soul to be more precious than that of the body. In consequence any one with goodness of soul gives him satisfaction. Such a man he loves and cares for, and he seeks and expresses such words as make young men better, in order that he may be forced to see the beauty of laws and moral customs and understand that all this beauty is akin, and to think that bodily beauty is of little account. And after customs he

<sup>88</sup>Phaedrus, 246a-253c.

<sup>39</sup> Symp., 210a ff.

must be led further to the beauty of the sciences, that seeing beauty in many things and no longer that of one only, with a menial love for the beauty of some youth, either of one man or one custom, himself a mean slave and of no importance—but, drawing towards the ocean of beauty in many things, and gazing upon it, he expresses many beautful and magnificent thoughts and conceptions in abundant philosophy.

There he increases in strength and power, until he sees one such science, which is of this beauty."

The man who reaches the end of this journey "will suddenly perceive something marvellously and inherently beautiful, that very thing, Socrates, which was the goal of all his previous labours. Something which, firstly, always exists, which does not come into being and is not destroyed, does not increase or fade away, which is besides, not beautiful in a certain way, and in another way ugly, not beautiful at a certain time and not at another time, nor is it beautiful in relation to one thing, and ugly in relation to another, nor in one place beautiful, and in another place ugly, nor beautiful to some men, and ugly to others. Beauty will not appear to him as having a face, or hands, or any part of the body. It is not some particular reasoning or some particular science. It is not contained in something else, as if it were in a living being, or earth or heaven or anything else, but it is by itself, of itself, and always of one kind."

Such then is the Platonic idea of beauty: it is the harmony of the world which is the result of the introduction of measure or number by intelligence; it is inseparable from Good, and is perhaps best described as the cause of it, though the two are but aspects of Ultimate Truth, and the contemplation of it gives the most real pleasure, because the most lasting and the most "pure".

What exactly is the relation between the supreme

Beauty, which seems to live in a world so far removed from that of everyday life, and phenomena? Plato does not clearly say. The question is the same for the whole world of Platonic ideas and is really a metaphysical one. It is the old problem of the influence of mind upon matter.

It still remains for us to find a satisfactory reason for

Plato's severity towards the poets.

In the Republic<sup>40</sup> he divides the Universe into four classes:

- (1) images, such as reflections in a mirror, etc.,
- (2) the phenomena,
- (3) scientific formulae arrived at by hypothesis, and
- (4) supreme truths or ideas.

These four classes are each more real than the preceding. The first two are apprehended by sense perception and opinion; the last two are objects of knowledge. Now the products of art are included in the first class, as imitations of phenomena. All the artist can do, therefore, is to reproduce as exactly as possible certain particular occurrences, and his greatest masterpiece will still be "three times removed from the truth."41 It is important to realize that this view, although consistent with, does not necessarily follow from Plato's utilitarian view of Beauty. Even if the purpose of art is purely didactic, why should not the great artist imitate, or reflect, the ideas, in the same way as the phenomena themselves?42 We are told that Plato condemned poets because the fourth century artists were bad, but that would not have blinded him to the merits of poetry as a whole.

It is also true that great art is intensely individualistic. A tragedy is as much concerned with the peculiarities of its hero as with his resemblances to the rest of mankind. Hamlet and Lear are like nobody else, real or imagined. But

 $<sup>^{40}509</sup>$ d ff. For a full explanation of this division see J. Adam's notes ad loc.  $^{41}Rep.$ , 509a.

then, the natural phenomena are equally individualistic, and yet they reflect, and "in some way" share in the idea.

The real reason will be found in Plato's own aesthetic experience. There can be no doubt that he found works of art aesthetically pleasing. 43 But it is noteworthy that the passages which show a real appreciation of artists, apart from their value as teachers, and which grants them a "divine" inspiration occur in the earlier works.44 The Ion is a typical example, for in that dialogue Socrates says that great poems and songs are written under direct inspiration from the Muses. 45 And this poetical frenzy is to a certain extent passed on to the hearers, through the intermediary of the rhapsode. The poet is compared to a magnet that can pass on its power to what comes in contact with it. But he has no knowledge of what he writes. This absence of knowledge is often insisted on. That these products of the artist are beautiful is, however, unquestionably asserted.

But in his later works Plato insists more and more upon the intellectual side of Beauty, and uses the word beautiful more sparingly of works of art, though they are of course still useful. He even goes so far as to say that nothing which imitates particular phenomena is beautiful."

I suggest that, as Plato grew older, his appreciation of art—by which he especially means poetry and music—declined. This does not mean that his aesthetic sense became dulled but that it developed in another direction. Being himself an artist, he felt pleasure in the contemplation of life and nature. There are passages which show a keen ap-

<sup>42</sup> Sometimes indeed Plato comes near to doing this: see the picture of the perfect man, Rep., 472d. See also Rep., 400c-401a. Socrates admits that painting and sculpture can express character, in *Memor* III, 10, 1-8.

<sup>&</sup>lt;sup>43</sup>For full references on Plato's attitude to the poets see C. L. Brownson, Plato's Studies and Criticisms of the Poets (1920).

<sup>44</sup>Lysis, 214a: "they are, as it were, our leaders in wisdom;" cf. Prot., 316d; Rep., 366b. Paintings are spoken of as beautiful in Hipp. Maj., 298a and Rep., 401a; music in Gorgias, 474e., Ion, 534a and passim.

<sup>45</sup> Ion. 534b.

preciation of natural beauties, as his description of the resting place where the discussion takes place in the *Phaedrus*,<sup>47</sup> and we may perhaps add his admiration of the stars in the *Epinomis* and the *Timaeus*.<sup>48</sup> Indeed we find Socrates saying that when he sees painted animals, or animals perfectly still, he wants to see them moving and living.<sup>49</sup> But as Plato grew in years he became more and more familiar with abstract ideas, and came to live even more intensely upon the intellectual plane. Nothing could then give him more pleasure than the discovery of a new idea, a further glimpse into the relations of the forces that are at work behind and beyond the world of becoming. The pleasure which the contemplation of works of art could give him was as nothing to the pleasures of study and research.

Charles Darwin complained that, as he grew old, he lost his aesthetic sense. Of this H. J. Marshall gives the following explanation:50 "In reality he had lost the sense of beauty in the contemplation of works of art which were beautiful for him in his younger days, and to which the word beautiful had become so thoroughly attached in his mind that he could not dissociate it from the object. On the other hand he, as the result of his special mental occupations, had gained new and unusual mental fields; and, I have no doubt, found as distinctive an aesthetic thrill elsewhere. in his observation of developing forms of life, for instance, as he had even found in the artistic works of great masters." May not some such a change have taken place in Plato's mind? The habit of abstract meditation had given him the power to find more delight in his own thoughts than anywhere else. Conceiving these thoughts to have

<sup>48</sup> Timaeus, 28b.

<sup>&</sup>lt;sup>47</sup>Phaedrus, 230 b-c, and the interest shown in the grasshoppers, 259a-d. Also 276b.

<sup>48</sup> Epinomis, 977b.; cf. Timaeus, 38a.

<sup>49</sup> Timaeus, 19b.

<sup>50</sup> The Beautiful, p. 81.

objective existence he attributed beauty to them and concluded that a similar training would bring this intense and—to him at any rate—aesthetic pleasure to others. That is his meaning where he tells us that the aim of education is the appreciation of beauty.<sup>51</sup> He never denied the beauty of art. But he asserted that it was less than that of the phenomenal world, and far inferior to that of the world of the intellect.

It is easy to dismiss this "beauty of the supra-sensous world" as "a metaphor" and a "confusion". It is more difficult to prove that the pleasure felt by the enthusiastic student, when, after many weary hours of search, suddenly the light appears and everything falls into its place, is essentially different from the pleasures given by a revelation of physical beauty.<sup>52</sup>

Physical beauty then only existed to the mature Plato, because it "reminded" him of the ideas that had given him so much delight and of which the phenomena were illustrations.

It now becomes clear why it was not unnatural for him to classify the products of the fine arts so low in the realm of beauty, inferior as a source of aesthetic satisfaction to life itself, and to the pleasures of study. Granted this attitude of mind, the decline of contemporary poetry may have helped to justify it. The metaphysical theory of the *Republic* (which may itself have been largely due to Plato's aesthetic experience) was ready to hand; add to this that his moral enthusiasm was shocked by the outrageous stories the poets told about the gods. But all these were but secondary causes which made excellent arguments against the fine arts but could not condemn them unaided, and which Plato could have overcome without difficulty, had he drawn his greatest aesthetic delight from the inspira-

<sup>51</sup> Rep., 401a, ff.

<sup>52</sup> See Santayana, The Sense of Beauty, pp. 94, 199, 209.

tion they gave him.

But aestheticians cannot forgive Plato for not attempting to end the "ancient quarrel" between poetry and philosophy, he who was both a poet and a philosopher. Bosanquet considered an account of Plato's views on art to be a sufficient account of Plato's aesthetic and others have been so far misled as to maintain that he was one of those who "have thought and spoken of the aesthetic demands of man as of insignificant importance." Enough has been said to show that this view is clearly mistaken.

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<sup>53</sup> Rep., 607b.

<sup>54</sup>In his History of Aesthetic.

<sup>85</sup>H. J. Marshall, The Beautiful, p. 201.

## A SPIRITUAL BEHAVIORISM

THE VIEW is generally held that the doctrine formerly known as materialism (but which I shall designate as physical monism), and the belief in an idealistic or teleological conception of the universe are incompatible theories of the world. Idealists and mechanists seem to be agreed that anyone who holds to both conceptions must be something of a multiple personality. Behaviorists are laboring under the delusion that all one has to do when he wishes to develop a "scientific psychology" is to accept the postulates and categories of physical science (and especially the doctrine of the conservation of motion), and he is thereby committed to relegating purpose to the limbo of animistic survivals. But if we widen our conception of physical processes to include purpose—and C. G. Darwin and others have pointed out that in atomic behavior the electron seems to display memory and a knowledge of the future—then we can accept teleology without fear of thereby introducing supernaturalism into science.1 In the present

¹By "purposive" behavior I mean that type of process which within certain limits is controlled by the past and is anticipatory of the future. In the atom the "memory" of the electron is related to the vector known as "angular momentum." In biological phenomena it is generally admitted that the past (or its results preserved as "memory") is active in present behavior. But the idea that the "future" also helps to determine the present seems preposterous to many. Dr. Alfred J. Lotka, with whom I have discussed this question of what I have termed "control of the present by the future," does not admit the necessity of the notion of purpose in explaining evolutionary advance. But I hold that the notion of the instantaneous present, like the limit of a differential, contains a vicious abstraction. Dr. Lotka has also discussed this subject in his Elements of Physical Biology. Hermann Weyl has touched upon the matter in his Was ist Materie? I have discussed these problems in detail in an article "The Problems of Time in Science and Philosophy," which appears in The Philosophical Review, 1926, Vol. 35.

essay I hope to show that a "spiritual behaviorism" can be derived from the most fundamental principle of physics,

the principle of least action.

I shall first summarize the historical development of the concept energy; and then, after exhibiting its status in modern physical doctrine, I shall set forth what seem to me to be its philosophical implications.

## THE EVOLUTION OF THE CONCEPT OF ENERGY

It has become fashionable to attribute to Aristotle the formulation of the view that qualities inhere in a thing-like core, as pins stick in a pin cushion. New Realists argue that this substance-quality view is the consequence of the Aristotelian logic of classes. But it must not be forgotten that for Aristotle the conception of energeia as the cause of motion takes precedence over the notion of substance, which latter seems to be nothing more than the permanent possibility of action. In other respects the consequences of the Aristotelian metaphysics have been less fortunate. His law of falling bodies, making velocity dependent upon mass, was false and had to be corrected by Galileo. And the influence of Aristotle in shaping the Scholastic doctrine of the thing and its qualities is also well known.

Physicists do not generally recognize the extent to which the present formulation of physical creeds is determined by the historical evolution of physical philosophy. It is especially true that modern scientists do not sufficiently appreciate the importance of the interaction between the views of Descartes, Leibniz and Newton, with the subsequent triumph of Newtonian physics.

Descartes, as is known, attempted to lay the foundations for a completely mechanical view of physical nature. In doing this he developed the Cartesian coördinate system, thus laying the basis for analytical geometry and Newtonian mechanics. In his law of motion of bodies, as

given in the statement that the product of mass by velocity is constant, Descartes presented a noteworthy formulation of the conservation of the quantity of movement. The interesting thing for us is the way in which the mechanical conceptions of Descartes reappear in Newtonian physics. Following the Cartesian view of the quantity of motion, or "momentum," as fundamental, Newton arrives at *force* as a "primary magnitude." In the dynamical theory of Newtonian physics the concepts of *force*, mass and momentum are the basic categories.

Had Newton been able to foresee the inevitable logical consequences of his doctrine in the godless universe of Laplace he might have been constrained towards a more hospitable regard for the views of Leibniz. The Leibnizian effort at a reconciliation of the mechanical universe of Descartes with a teleological view of nature rests on the reinterpretation of the notion of substance (or Cartesian extension) in dynamic terms. If Newton had followed Leibniz, as Huygens did, work, mass and energy (Leibniz's vis viva is "kinetic energy") would have been the primary categories.2 But even though, as Bertrand Russell points out in his Critical Exposition of the Philosophy of Leibniz, several types of dynamical theory are confused, Leibniz's formulation of the law of motion as proportional to the square of the velocity has adapted itself more readily to the purposes of physics than the law of Descartes.

Maupertius (1698-1759), who was early given over to speculations as to what grounds the Creator had for preferring the law of inverse squares to all other possible laws of attraction, is generally credited with having first enunciated the law of least action. He utilizes Leibniz's idea of making nature invariably work with a minimum of action. He states that light neither takes the shortest

<sup>&</sup>lt;sup>2</sup>A History of Physics, by F. J. Cajori, 1899, pp. 52-53.

<sup>3</sup> The Principle of Least Action, by P. E. B. Jourdain, Chicago, 1913.

path nor the path which it describes in the shortest time, but "that for which the quantity of action is least." The quantity of action is taken to be the product of the mass of the bodies times their velocity through the space they may traverse.

It is interesting to contrast the idea of Maupertius that following the line of least resistence testifies to the expression of the wisdom of the Creator with the modern idea that the doctrine of the conservation of motion dispenses

with the necessity of a Creator.

While Maupertius in 1747 attempted to formulate a single principle of "least action," the first important quantitative advance had already been made by d'Alembert in 1743. These attempts stimulated Euler to thinking about the problem, and his ideas were eventually summed up in the simple principle that when v is a function only of the coördinates of the particle, the expression  $\int v ds$  will be a minimum for the actual path of the particle, where ds is an element of the path, and v is the corresponding velocity. Euler assumed that the existence of maximum or minimum conditions in natural phenomena could be determined. Lagrange continued the work of Euler and d'Alembert and obtained a more comprehensive set of differential equations.

Another line of investigation results in a somewhat different way of expressing this same principle of the conservation of motion. Already in 1738 Daniel Bernoulli had turned to the impact of moving particles for the explanation of the pressure of gases. This kinetic theory was extended by later physicists. The doctrine of kinetic energy, an outgrowth of the theory of "central forces," is the prelude to the principle of the conservation of energy. Newton suspected the presence of the principle of the conservation of energy in mechanics, and Rumford had maintained the universality of the laws of energy. But Joule

and Mayer established the particular principle of the exact equivalent of the amount of heat produced and the amount of mechanical energy destroyed. The principle of the conservation of energy finds its verification in the discovery of the mechanical equivalent of heat.4

Eventually this doctrine that nature is stingy in her activities achieves the form in which W. M. Hamilton leaves it at the beginning of the nineteenth century. By assuming that the energy of a dynamical system consists of two proportions, the kinetic energy T and the potential energy W, Hamilton arrives at the formula of the conservation of energy as expressed by the equations T+W= constant. In this form the principle of least action asserts that when a system passes from its state at one instant of time t<sub>1</sub> to the state at a second instant of time t<sub>2</sub>, the sequence through which the system passes is such that the mean average value of the difference between the potential and kinetic energies during the interval of time of change will be a minimum. Mathematically this principle is stated in this form

$$\delta \int_{t_x}^{t_z} (T-W) dt = 0$$

Thus through the co-operative efforts of Leibniz, Euler, Lagrange, Hamilton, and later Gauss, and others, the

<sup>4</sup>The principle of the conservation of energy and the principle of least The principle of the conservation of energy and the principle of least action are not identical, although the former can be derived from the latter. The principle of least action is the more general principle. The relation between the two is brought out clearly by Max Planck in his A Survey of Physics, p. 110. "As an illustrative example, let us consider the motion of a free particle under no forces. According to the principle of the conservation of energy, such a particle moves with constant velocity, but nothing is said concerning the direction of the velocity, since kinetic energy does not depend on direction. The path of the particle could, for example, be rectilinear or curvilinear. On the other hand, the principle of least action demands, as we shall show in detail below, that the particle must move in a straight line."

"The reason for the difference in the results derived from the two principles lies in the fact that when applied to any problem, the principle of the conservation of energy furnishes one equation only, while it is necessary to obtain as many equations as there are variables in order to determine the motion completely. . . . . Now the principle of least action furnishes, in every case, as many equations as there are variables."

doctrine of the conservation of movement, the "mother of analytical mechanics" becomes a general principle of dynamics. The philosophical importance of this conception cannot be stressed too much. This law of thrift is the forerunner of the principle of economy of which Ernest Mach makes so much use. And the bearing of the principle of the conservation of energy upon the mind-body problem, the law of parsimony, and the principle of the uniformity of nature is well known.

#### MATTER AND ENERGY

Two conceptions stand out in classical mechanics. These are the doctrine of the conservation of matter and the doctrine of the conservation of energy. W. Ostwald, it will be remembered, attempted to set aside this dualism of matter and energy in his *Naturphilosophie* of energetics. But Oswald's system fell to the ground when electrons were discovered, for his view excluded a corpuscular metaphysics. Nevertheless, the physicist seems to be reconstructing his picture of the universe somewhat along the lines pictured in Ostwald's energetics.

One of the most interesting developments in modern physics is the overthrow of the doctrine of the conservation of matter. Theoretical physics now tells us that energy is the sole reality in nature. The experimental justification for casting overboard the formerly sacred idea of the conservation of mass was found when it was shown that mass is a function of velocity, and is not invariant under all conditions. In the theory of relativity mass appears as a special kind of energy. Matter can be transformed into energy, and energy can manifest itself as mass.

This means, therefore, that energy exists in two conditions: It may be "bound" as in matter, or aggregates of electrons, or it may be "free" as in radiant energy, e. g., light. Does this imply that light may be converted into

electrons, and vice versa? After discussing the question of reciprocal conversion of matter and energy Sir Oliver Lodge<sup>5</sup> raises the further question: if the stopping of the motion of an electron generates a wave of light, does this mean that when a wave of light is stopped it generates an electron? Is it possible, Sir Oliver asks, that radiation is a half-way stage between aether and matter? Matter, we knew, tends to fall together gravitationally; radiation tends to spread towards the outermost boundaries of the universe. Can we suppose that this energy is not completely lost by dissipation, but that there is a reintegration of energy by a process in which matter is actually generated? One would hesitate to indulge in such speculations if he did not have the sanction of seriously minded physicists. Dr. J. H. Jeans supposes that such a transformation of matter and radiant energy accounts for the intense radiation from the stars. Joseph Larmor has also recently expressed doubts concerning the permanence of substance. and this only reinforces the suggestion of Lodge that energy may pass from matter to aether and back again.

Other consequences equally surprising flow from this marvelous picture of the universe which physics and astronomy reveal. If a body absorbs a quantity of energy E, the body behaves as though its mass were increased by a quantity of energy  $E/C^2$ , where C is the velocity of light (though it must be remembered that the measurement must be made from a system at rest with reference to the body observed). If a body delivers up energy its mass is decreased by  $E/C^2$ . The relation between inertial mass and energy is given by the equation  $m=E/C^2$ . All mass is energy and the energy stored up in any body is  $mC^2$ . This value is very great because C, the internal of intra-atomic energy, is so large; so that for all practical purposes, alterations of energy through radiation or absorption are neg-

<sup>5&</sup>quot;The Aether and Electrons", Nature, Vol. 112. pp. 85ff.

ligible so far as mass is concerned.

The "energy density" at any point per unit time equals the energy flux entering or leaving the unit volume. An electron in motion is to be considered as a sharply delimited sphere of space wherein the electromagnetic energy of the field is concentrated. According to Newton the sphere of action of matter varies inversely as the square of distance Newton's law must now be regarded as expressing the attraction of energy by energy, and allowance must be made for the variations of mass which accompany the variations of velocity of bodies measured with respect to the absolute velocity of light.

### WHAT IS ENERGY?

In a spiritual behaviorism the fundamental reality of the universe is energy. Here we are following in the steps of Huxley when he asserted that nothing endures in the universe save the ordered flow of energy. But there are others who are inclined to criticize this reification of the concept of energy into a reality-in-itself. Preceding the advent of ultra-modern physics there were two answers to the question, is energy real? In the one view, energy is a reality having the same degree of validity as matter. In the second view, energy is considered to be an abstraction, or a mathematical function. In his The Philosophy of 'As If', H. Vaihinger classifies energy as a "personificatory fiction" (Eng. trans., p. 36). Similarly, in criticising Herbert Spencer's notion of the persistence of force Bertrand Russell points out (Mysticism and Logic, p. 104) the error of identifying a mathematical constant with a particular entity.

Professor W. P. Montague has argued that consciousness is nothing more than potential energy associated with the cortical synapses. Unfortunately the notion of "potentiality" is very difficult to think through. In physics po-

tential energy is introduced to balance the accounts. As H. Hertz<sup>6</sup> points out, potential energy does not lend itself at all well to any definition which ascribes to it the properties of a substance. The amount of substance is necessarily a positive quantity; but we do not hesitate in assuming the potential energy in a system to be negative. But in reply to such objections it might be said that energy does not need to be made into a substance to be real. This notion has always been the fallacy of materialism. To attribute to potential energy a negative value does not mean that it is less than nothing, but that it is mathematically convenient so to treat it. In his very excellent work on The Mystery of Mind (1926, Ch. XV) L. T. Troland argues for a view which resembles Dr. Montague's. Potential energy is represented by the stretched condition of the "lines of force" which make up the electrical fields. He further argues that pleasantness is correlated with the decrease of synaptical resistence in which potential energy is converted into kinetic.

If anything in the universe is real it is energy. I shall continue to assume that energy is something more than a mathematical constant. This is not saying that we know what energy is. If we can not agree that a thing is what it does then we must concur with Wm. McDougall when he says that what energy is no man can tell, beyond saying—it is the possibility of change, of further evolution. But this evolution, it must be added, is always the evolution of different complexes of energy.

#### CONSERVATION IN RELATIVITY THEORY

Since mass and energy are regarded as synonymous, the conservation of mass and energy are two expressions of a general principle which can be termed the conservation of the "world impulse". Mass, in the older sense, is not

<sup>6</sup>The Principles of Mechanics, London, 1899, p. 22.

conserved, but it is the total quantity of mass and energy which remains constant. There has been some discussion as to whether the *geodesics* which bodies follow define a minimal principle of action or a maximal principle. In ordinary mechanics we like to picture the motion of bodies as a linear relation between the coördinates of space and time. This is a straight line in the geometry of Cartesian coördinates. The exact form which this demand that bodies move in minimal lines should take in the theory of relativity is a matter of dispute. The problem is to translate the restriction that  $\int ds$  be a minimum (i. e.,  $\delta \int ds$ =0) into terms of geodesics in the non-linear equations of the general theory of relativity.

Under certain conditions the idea of straightest and shortest coincide. This is true in the theory of curved surfaces. In conformity with the "impulse energy tensor" of the theory of relativity a particle takes the line of least resistance in the sense that the trajectory it traces out in its motion expresses the geodesic line for that manifold. If the time path of a particle be considered as a fourth coördinate of the space-time continuum, this world-line will, in its most general form, be represented by the arc of a great circle traced through the curvilinear universe. Action (i. e., energy integrated through time) is conserved, because action is related to the curvature of the world. Here the princple of least action becomes transformed into the conservation of the world-impulse. Action is conserved because energy can not wander off to infinity. We are living in a spatially closed universe.

Does this mean that nature as a whole takes the line of least resistance? I do not see that it does. For any point in the path of progress (i. e., a tangent to the cosmic curve of action) motion is conserved, but in the long run nature rises above mechanism because *time* is not a closed dimension (does not return upon itself), as are the space dimension

sions, but time is open towards plus and minus infinity. The cosmic curve of action (the macroscopic time-line) may be curvilinear, but it ought not be a circle: an ellipse or a spiral would be nicer. If time returned upon itself nothing new could really happen, and we should be forced to accept Nietzsche's doctrine of eternal recurrence. But perhaps what we humans think to be "nice" may have nothing to do with the matter.

#### THE CONTINUANT

Philosophically the most important fact which emerges from the researches in theoretical physics is that matter is not so substantial as it used to be thought. Apparently the only psychologist who is alert to the significance of this is C. S. Meyers, who points out that the effect of this is to make it less difficult to understand the interaction of psychic and neural energy.

The average person is unaware of the extreme difficulty of defining what constitutes a "thing." Philosophers outgrow the naive viewpoint of the "common man" when they recognize that the thing is, to a certain extent, a "teleological construct." The problem becomes still more complex when we make the further discovery that the constancy or permanence of a thing is relative, not only to our human purposes, but also to the physical frame of reference from which it is observed. So far as these problems are concerned the most fertile suggestion which the present writer has met with is presented by Dr. A. N. Whitehead's when he suggests that "amid the alternative time systems which nature offers there will be one with a duration giving the best average cogredience with the subordinate parts of the percipient event" (italics are present author's). I

<sup>7&</sup>quot;On Consciousness," Proceedings of the Royal Society of Medicine, 1925, Vol. XVIII, pp. 9-13.

<sup>8</sup>The Concept of Nature, p. 111.

am surprised that Dr. Whitehead's speculation (p. 69) that the alliance of the passage of nature with the passage of mind, given in sense awareness, arises from their sharing in some ultimate passage which dominates all be-

ing has not been made more of by the idealists.

But giving full weight to the facts which indicate the extent to which the observer's "apperceptive synthesis" enters into the "thinghood" of the object perceived, it seems to me that every type of object must possess thinghood of its own right. Each type of object in nature must have an inherent unitary mode of behavior peculiar to itself. Furthermore, the "material" elements of which the thing is composed (molecules, atoms, electrons, etc.) are themselves unitary modes of behavior which remain invariant for the particular complex into which they enter. A thing, therefore, is a synthesis of micro-events. The permanence of substance arises from the fact that a group of random movements is organized into a new unitary "stuff" because the thing retains an integral value with respect to the frame of reference from which it is viewed. Every unitary group of movements expresses "central tendency" of a statistical configuration of elements, which, in their range of action. vary within narrow limits about a mean position. Any thing is a kind of statistical constant of high stability. This doctrine is now of special importance in chemistry, where certain elements formerly supposed to be simple (e.g., mercury) are now known to have several forms, and the element is really an average of several isotopes.

Adopting a type of classification popularized by C. D. Broad, we might speak of electrons as first order objects, atoms as second order objects, molecules as third order objects, and so on. I shall take over a term used by W. E. Johnson in his Logic (vol. III) and refer to these objects as continuants. Thus, in molecular phenomena, the atom is a continuant. But in radioactive transformations even

the atom may cease to be a continuant, though the electron remains a continuant here. Since the term continuant designates the invariance of behavior which constitutes the permanence of the object, we may extend the range of its use beyond the field of the inorganic and refer to life as a continuant, in the sense that certain principles of behavior remain invariant for the specific aggregates of colloids which constitute the protoplasms. Mind is also a continuant in the sense that it is a relatively stable dynamic synthesis of the units of the "psycho-physical continuum." The self, in this view, is a statistical constant (functional unity) of psychic isotopes. The tendency to preserve the stability of the self (to return to a physiological equilibrium E. Rignano would say) underlies the purposiveness of human conduct. For this reason the higher levels of synthesis in the nervous system assume domination over the separate reflexes of the lower levels. But where the integrative action is insufficient the central unity breaks down into the separate selves or psychic isotopes, and multiple personality results.

# PROBABILITY, NATURAL LAW AND PURPOSE

There has been much dispute as to whether any conclusion can be drawn with regard to the reality of purpose from the fact of the adaptation of organism to environment. I shall not attempt to argue the question in this form. But I hope to show that considerations of probability provide a better basis for the doctrine of teleology in nature. In the first place I shall attempt to show how it might be argued that the existence of an uncontrolled universe throughout all eternity is at least infinitely improbable, and then I shall state the answer which might be made by those who conclude that nothing can be proved

<sup>&</sup>lt;sup>9</sup>W. J. V. Osterhaut in his *The Nature of Life* abandons growth, reproduction, motion and irritability as the invariable differentia of life and selects destructive metabolism and selective permeability as the invariants of living matter.

by arguments based upon probabilities. Then we must make our choice between the two positions.

The argument against mechanism has been well stated by Bergson, when he attempts to show that a series of variations in all directions, occurring in an accidental order, could not have produced an organ such as the eye. Orthogeneticists have also stated that many variations are not "useful" until several along a certain line of differentiation have assisted each other, so to speak. It is necessary to suppose, Bergson argues, that a purposive agency must have produced homologous structures along divergent lines of evolution. After the publication of Darwin's "Origin of Species" Mr. J. J. Murphy10 argued that no theory of selection yet propounded could explain the development of the eye: "It is probably no exaggeration to suppose that in order to improve such an organ as the eve at all, it must be improved in ten different ways at once, and the improbability of any complex organ being produced and brought to perfection in any such way is an improbability of the same kind and degree as that of producing a poem or a mathematical demonstration by throwing letters at random on a table."

Now a popular argument presented by biologists to explain the emergence of a particular result in evolution (such as the extremely complex configuration of inorganic elements necessary to any specific protoplasmic system) runs somewhat like this: Admitting that any combination of factors is statistically of a very low degree of probability, nevertheless, if you give nature an indefinitely long time in which to work, every possible kind of combination will at some time or other be produced. And among these combinations will be what we call living matter. But the advocate of a purposive agency might meet this

<sup>&</sup>lt;sup>10</sup>The following passage is quoted from Sir Arthur Keith's Huxley Lecture on "The Adaptational Machinery Concerned in the Evolution of Man's body," Nature, 1923, Vol. 112, pp. 257 ff.

reply with the following: Previously we have supposed that the successfulness of any mutation depends on the convergence or intersection of several lines of differentiation. Let us assume further that the production of a given variation in any one line of differentiation is governed by a series of factors ("causes") which itself is infinitely complex. Does it not follow that the likelihood that these mutually necessary variations will occur simultaneously is not only infinitely improbable, but that the improbability is of a higher order of infinity? That is, to view the thing mathematically, the likelihood of any one point of a line (an infinite series) meeting any other specified point of another line in the same plane would be of the order of improbability infinitely squared, ∞2. The reply to this might be that there is as much time as there are probabilities. But is there any sense to supposing that nature has infinity to the infinity power to work in? This, I presume, might be a fair statement of the modern version of the "watchmaker theory" of the universe. What reply might be made to such a course of reasoning?

There is no mystery about the facts of adaptation and the evolution of what seem to be purposive structures. Donly those structures that persist (survive) because they are "adapted" come under our observation. Those that are not "adapted" for the most part escape our observation. Thus we gain the impression that the structures that have persisted were brought into being by their adaptedness, whereas the fact is that they were merely brought into our observation by that "adaptedness" Both the adapted and the not-adapted were brought into existence by circumstances impartial to their "adaptedness." Those persons who keep reminding us (quite

<sup>&</sup>lt;sup>11</sup>I have discussed this matter with Doctor Alfred J. Lotka. His reply to the foregoing arguments is the best statement I have come across and what follows in the next two paragraphs is largely in his own words. Dr. Lotka has discussed the matter in his *Elements of Physical Biology*.

unnecessarily) that natural selection can at best be an eliminating, not a producing, process overlook the fact that no one has ever claimed that selection is anything more than this; but this eliminating action seems competent, at least qualitatively, to account for the fact that the observed forms (i. e., the comparatively lasting forms) are of the adapted type. If nothing but adapted forms ever came into being we might be tempted to look for a productive agency in adaptation. But the fact is that unadapted forms are produced by the same physiological processes that also produced the adapted forms. That they (the unadapted) are not more common is due to the fact that our observation is made on the relatively adapted stock, for the non-adapted stock must, from the very nature of things, be in the minority.

Another fact to be carefully borne in mind in questions of this sort is that we are here dealing with the probability of a combination of events which undoubtedly are not independent. This, of course, very materially influences the numerical value of such probability, in accordance with a fundamental principle in the calculus of variations.

The effect of the above statement is not to undermine the doctrine of purpose, but only to render ineffective the value of the arguments for teleology in so far as they rest upon the specified considerations of probability. The precise rôle and point of attack of purposive agencies in the affairs in a material universe is undoubtedly a good deal of a mystery today. If the proof for purpose ever comes it will not be based upon probabilities, Doctor Lotka informs me, but on a knowledge of the nexus of material happenings and psychic agencies. Personally I do not see how probability, if it be real, can be divorced from the progress of nature. I come back to the fact that a mechanical universe is one in which time does not count. But since man, who is a product of evolutionary forces, has developed an intui-

tive consciousness of time which is of an irreversible order (non-mechanical), there must be in nature an energy operating which makes what does happen in the universe something more than merely the spatial redistribution of mass particles. And I believe that Bergson is right in pointing out that this moving energy (l'élan vital) is more akin to the experienced time of duration than the measured (spatialized) time of physics. However, it seems to me that this principle operates not only in the field of the organic, but also in the realms of the inorganic, the domains of the physical sciences.

A gap similar to the one which separates physics and biochemistry appears in the jump from electrons to atoms, atoms to molecules, and molecules to crystals. Within any level of nature the law of behavior of the elements may be mechanical. Here the effects are averaging effects, and whatever unity there is is that of a statistical constant. But when you pass from one type of object to another probability becomes discontinuous.

Back in 1874 Helmholz<sup>12</sup> suggested the possibility of two kinds of laws: the first type of law is associated with forces of the first class, such as gravity, the intensity of which is independent of time and velocity and dependent upon distance; and forces of the second class, such as electrodynamic forces, which become active only under certain conditions of motion (i. e., induced currents, electromagnetic phenomena). I doubt whether this particular distinction is now tenable, but it does seem to be true that there are two types of laws in the universe, and that the distinction between mechanical and purposive forces is somehow related to statistical and non-statistical laws.<sup>13</sup>

<sup>&</sup>lt;sup>12</sup>"On Later Views of the Connection of Electricity and Magnetism," Smithsonian Institute Reports, 1874, pp. 246-253.

<sup>18</sup> Under the head of "Statistical Law and Ontological Proof" Professors W. H. Sheldon and H. R. Smart carried on a discussion in the *Philosophical Review* (1924) which bears upon the problem of the duality of natural law. Unfortunately they could come to no definite conclusions.

Thus the second law of thermodynamics simply does not apply to the transition states, from one type of object to the next, because it expresses a disorderly tendency of things to become mixed up, whereas when we pass from atoms to molecules a new type of law or orderliness appears, and this orderliness is discontinuous with the probability of the previous system.

#### INTEGRATION AND EVOLUTION

It was previously pointed out that there is a very intimate relation between matter and the field of energy in which it is imbedded. The so-called empty space which surrounds material particles is filled with the radiant energy which makes chemical action possible. One kind of frequency is active in the behavior of atoms. Professor Millikan's discovery of "penetrating rays of cosmic origin" is opening the eyes of our imaginations in this direction. Another type of frequency (e. g., infra-red rays) may be active in chemical (thermodynamic) and molecular behavior. And we are just beginning to understand the influence of radiant energy on living matter.

This brings us to the most difficult problem of why those aggregates of bound energy which we call things emerge. Higher types of objects (continuants), we have seen, emerge in nature because the course of evolution is not controlled entirely by the differential equations of dynamics. Natural processes seem to be a compromise between the principle of least action and the principle of maximum energy expenditure. This time-spanning energy is the moving power behind biological evolution. But first let us approach the problem on the inorganic level.

Newton showed that the force of attraction F, between two material particles of masses  $m_1$  and  $m_2$ , separated by

<sup>14</sup>In his book on Atoms (1916) Jean Perrin takes the position (p. 163) that "the essential mechanism of all chemical reactions is therefore to be sought in the action of light upon atom."

the distance d, is expressed by the equation F=G.  $\frac{m_1m_2}{d^2}$ .

This law, as we have seen, must now be construed as expressing the attraction of energy by energy. In this form the law is stated independently of the qualitative nature of the bodies attracted. Electrical charges are conceived to be balanced. The same geometrical relation underlies the force of attraction (or repulsion) between two charged spheres and is given in Coulomb's law

 $F=\pm K \frac{m_1 m_2}{d^2}$ . Here again the force acting varies inversely at the square of distance. That is,  $F \propto \frac{1}{r^2}$  where r is the distance between the poles. This relation, it is known, also underlies the variation of intensity of light and sound with distance. That is,  $\frac{I}{I_1} = \frac{r_1^2}{r^2}$ .

In the law of attraction of bodies and the law of radiation of energy we have two laws of similar form governing opposite processes. On the one hand, radiation tends to spread outward in spherical waves towards the outermost boundaries of the world; on the other hand, matter tends to fall together in accordance with gravitational attraction. The energy of matter comes from an unknown source, and proceeds into space towards an equally unknown destiny. If the source and the sink could be identified we could understand where the energy of matter comes from and where it goes to, and why the universe has not long ago run down. This view was at first suggested, I believe, by Professor W. D. MacMillan, and has been restated in different forms by Sir Oliver Lodge, J. H. Jeans, H. N. Russell, and others.

Is it a tenable hypothesis that "matter" is a compromise between two countertendencies; an inflection point where the cosmic curve of action changes direction? At one "pole" of nature the world is running down, and at

the other "pole" it is running up. But where are the poles? Certainly each atom has its poles, but whether there is polarity in the universe at large is a more difficult question. Professor K. Koffka has supposed that the whole universe is a Gestalt, but the universe as a configuration in which matter and energy undergo reciprocal conversion while vet retaining a macroscopic equipoise would seem to constitute an exception to the type of Gestalt which is illustrated by Dr. Charles M. Child's "metabolic gradients." Perhaps a final picture will portray the universe as a result of a compromise between two pervasive principles of nature: a principle of *least action*, which expresses the attempt to reduce the "surface tension" of our cosmic bubble, and a principle of maximal action, which designates the tendency to use up the available potential (or free) energy of configurations. A detailed application of these two principles to the various emergents in nature (or the cosmic Gestalt) will appear shortly.

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# CRITICISMS AND DISCUSSIONS SCIENCE AND SUBJECTIVITY

The question whether or not science must ultimately recognize subjectivity as a determining factor in its methodic ideal has recently been revived owing to certain developments within science itself. To a considerable number of thinkers there seems no way of interpreting the theory of relativity with its orientation from the standpoint of the observer confined within a seemingly parochial system of reference, save by frankly acknowledging the subjectivity of science and its ultimate centering in the point of view of the individual. This state of opinion finds a vigorous exponent in the English philosopher, H. Wildon Carr, especially in his recent book A Theory of Monads: Outlines of the Philosophy of the Principle of Relativity, where this thesis, together with the metaphysical and psychological conclusions deduced from it, is one of the outstanding contentions.

Science, according to Professor Carr, is today undergoing a revolution of well-nigh unexampled proportions involving a complete revision of its fundamental principle. It no longer seeks any independent objective absolute as a basis or believes that it studies a world of pure external existence apart from mind, but discovers instead that "ultimately every observer is the unique center of his own system of reference" and that "there is no objective scale by reference to which magnitudes can be assigned an absolute value." In consequence of this conversion to subjectivism, science is coming to discard the hypothesis of the atomic structure of the universe in favor of a monadic one, and to substitute for a mechanistic account of natural processes the freedom of individual activity.

For the benefit of those to whom this news of the volte face of the sciences may come with something like a shock, it may be well to sketch Professor Carr's reading of the evidence which he takes as pointing in this direction. Like all revolutions, this too has been long

<sup>1</sup>Carr, H. Wildon, A Theory of Monads: Outlines of the Philosophy of the Principle of Relativity, p. 79.

preparing, its causes deep laid in the nature of science. "Its fall of the Bastille," says Dr. Carr, "was the verification of Einstein's calculation of the shift of the stars, observed during the total eclipse of May 29, 1919." And as chief causes of the cataclysm, he enumerates three: (1) the doctrine of Berkeley, (2) the scientific conception of life, and (3) the modern criticism of mathematics which has led up to and found its culmination in the theory of relativity.

As for Berkeley, there are few who would care to deny that his philosophy has served to call the attention of thinkers, scientific and otherwise, to the part played by the percipient in the structure of knowledge and to the problems involved in determining the status of sensations and conscious states in that structure. Attempts to pass these latter off as non-existent or as mere shadowy redundancies (epiphenomena) of physical events have proved in the long run hardly more satisfactory to physicists than to philosophers. And it must be admitted that Berkeley's position has lately been reinforced from within physics itself through Einstein's clear demonstration that "the activity of the observer is an essential determinant factor of the nature of the physical fact itself." All this, however, seems perfectly possible of acceptance without our being obliged to draw the conclusion drawn by Carr that Berkeley and Einstein are therefore influences constraining science toward subjectivism. While Berkeley may be truly credited with having demonstrated the relativity and subjective dependence of the primary and secondary qualities, his demonstration has plainly to do with them as metaphysical entities and not as scientific facts. The questions at which he labored and the methods by which he answered them were first and last philosophical. and his influence on science was at best only indirect through calling attention to the problems involved in certain phenomena. Berkeley, and more especially Einstein, have brought home to the scientific world, it would appear, is not subjectivity, but the conviction that, if science is to hope for accuracy, all the conditions of a given event must be taken into account, and that what the object is experienced as must be accounted one of the objective conditions. To Einstein in particular belongs the credit of having shown that what the world is perceived as from any and all possible physical points of view constitutes the essential part, if not all, of its objective nature for natural science.

Another factor which, according to Carr, has been instrumental

<sup>&</sup>lt;sup>2</sup>*Ibid.*, p. 3. <sup>8</sup>*Ibid.*, p. 5.

in making clear to science the subjectivity of its method is the scientific conception of life. This conception, as it stands today, is derived through the application to biology of the mechanistic principles of physics, and represents life as the resultant of an evolutionary process governed by natural selection and the laws of chance. Even the intellect has no free life of its own, but is held to be part and parcel of the evolutionary struggle. Yet this inclusion of the intellect in the process eventually entangles the mechanically-minded scientist in a fatal contradiction. For how can the intellect be the product of a theory which it has itself produced? "How can the intellect, a mode of apprehending reality, be itself an evolution of something which only exists as an abstraction of that mode of apprehending which is the intellect?"4 The only answer to such a paradox, according to the author, is the admission that evolution thus mechanically conceived is a misleading fiction bred of the contrarieties of the intellect itself.<sup>5</sup> Whatever truth there is in the doctrine points rather to the reality of a free, psychical activity élan vital as the underlying source of all life and development. And here the name and teachings of M. Bergson in favor of a spontaneous, contingent evolutionary process are added to those of Berkeley and Einstein as a further influence pointing toward subjectivism.

But the charge that a contradiction is involved in the notion that the intellect can be both the source and product of evolution seems largely specious. At any rate, the contradiction, if there be one, appears not only in the mechanistic conception of life but in all theories which assume the genuineness of objective knowledge. For any view which would escape the circle of inner consciousness must assume the self-transcendent and self-representative power of thought to pass beyond the data of immediate experience and to adopt the rôle of spectator of its own development in the natural order. In all its relations intellect is obliged to assume its capacity as a theoretic means to reveal an end or object, of which it is itself a part, without necessarily distorting or falsifying the object. Indeed, there could hardly be a notion more baleful in its effects upon knowledge than that theory, broadly speaking, falsifies or itself creates 'facts' which it purports to disclose. Such a notion if once established would suffice to end the research.

<sup>4</sup>Ibid., p. 6. ·

<sup>&</sup>lt;sup>5</sup>Ibid., p. 5. "If intellect is a product of evolution, the whole mechanistic concept of the nature and origin of life is absurd, and the principle which science has adopted must clearly be revised."

A third line of criticism which, in Professor Carr's opinion, has played the really decisive part in discrediting objective and absolute conceptions in science, is that addressed to the foundations of mathematics. Modern investigations of the mathematical continuum show it to be a concept constructed from the implications of sensible perceptions; while recent criticism of the postulates of geometry has reduced Euclidean geometry from its apparently severeign status as the only possible science of space to that of a mere limiting case among an endless number of systems of equal rank, and in some cases based on directly opposite postulates. Such researches, according to Professor Carr, disclose how even mathematics (generally accepted as the typical exact science) is determined by the point of view of the subject. But it is only in the general principle of relativity that this view attains full cumulative expression to the extent that it effects 'a complete revolution of our notions of the structure of the universe.' "The essence of the general principle of relativity," he avers, "is to introduce the bane of the physicist, subjectivism, into the arcana of physical science."6 And elsewhere he describes the foundation of Einstein's and Minkowski's theory as "the conception of scientific reality as consisting wholly in individual experience," so that in consequence "the objectivity of science derives its whole meaning from the activity of the subject." The repeated failure of experiments like those of Michelson and Morley to determine the movement of a system by observations within the system is interpreted to mean that scientific results are in all cases finally regulated and controlled by the observer or the subject of the experiment.

But it is impossible to let these statements pass without question. After all, is it true that the theory of relativity is influencing recent science to abandon its belief in an objective standard and to accept subjectivity as its basic principle? An attempt to answer this question requires some analysis of what Mr. Carr means by subjectivity and an effort to understand in what sense he finds these tendencies operative in relativistic physics. (1) First of all, there seems little doubt that he holds as subjective every emphasis by recent science on the uniqueness of the observer's standpoint, and the recognition that each percipient measures the world in terms of his particular system of coordinates. (2) Indeed, Dr. Carr goes further in urging that only from a unique individual standpoint can any system be viewed in its integrity, and hence that science must accept as ultimate

<sup>&</sup>lt;sup>6</sup>Carr, H. Wildon, The General Principle of Relativity, p. 21. <sup>7</sup>A Theory of Monads, pp. 10-11.

the determinations of the individual subject which each system applies to itself. (3) Again he indicates his belief that in the theory of relativity an element of free choice, subjectivity in the sense of psychical spontaneity, becomes explicit. (4) Lastly, he implies that to his mind relativity marks the recognition by physical science of a transcendent factor, of subjectivity as denoting the presence of pure egos or monads as the directive force of the phenomenal process, even while they themselves remain outside the range of observable phenomena.

However unversed in the mathematical intricacies of relativity the student of philosophy may be (as is the case with the present writer), he may yet have gained certain general impressions of the theory which, in connection with his impressions of science, may seem to justify divergence from Dr. Carr's interpretation and the philosophical conclusions which he derives from it. The root of the trouble rests in Dr. Carr's contention that the theory of relativity represents the universe as constituted of monads. When you look behind the brilliant mathematical devices of Minkowski and Einstein, he declares, what you find is a conception of reality in essentials precisely like that of Leibniz: a view of reality as constituted of unique subjects of experience, each mirroring the universe in its active center, in which mirroring, moreover, the world of nature entirely consists.8 It is in the course of developing this parallel between Leibniz and Einstein that he is led to make what appear to be unfounded claims as to the subjectivism of the Einstein theory.

In calling attention to the uniqueness of the observer's standpoint, Mr. Carr has apparent justice on his side. The theory does indeed suggest that each observer makes his observations from his special space and time coordinates; and calls attention to the impossibility of knowing anything about the laws of nature independently of observer's and their systems of reference. On the other hand, its emphasis upon the observer's coordinates is not, it would seem, for the purpose of stressing the inner, elusive, unshareable character of the psychical, but rather to maintain the high tradition of scientific objectivity which requires that all the conditions of a given event be taken into account. Of these objective conditions, the measurement of the individual observer from the standpoint of his particular reference body must be accounted part: and should this fact be denied or overlooked, the results must inevitably involve just so much needless discrepancy and error. In calling attention to the effects of such oversight, the voice

8Ibid.. p. 10.

of Einstein is the voice of scientific objectivity. Here Whitehead has recently given the scientist's answer to the subjectivist interpretation: "The relativity of space and time," he says, "have been construed as.. dependent on the choice of the observer. But it is the observer's body that we want, and not his mind... The question is, why did (Michelson's) interferometer have black bands on its screen, and why did not these bands slightly shift as the instrument turned."

Moreover, although taking account of the observer, the theory of relativity seems far from conceiving the individual subject as the determining principle of reality, or from conceding that the ultimate truths of nature are to be found in any particular system of reference viewed from its individual standpoint. On the contrary, since the space and the time values of any given system are only relative, the possibility is precluded of finding universally valid measurements within such a system. True and universal conclusions regarding natural processes can only be reached, as I understand it, where we can combine according to certain definite rules measurements made from other reference bodies. In spite of the relativity of the spacetime measurements of each particular system, it is nevertheless possible to arrive at an objectively valid description of physical processes owing to the fact that all these particular measurements correspond according to definite rules, and can be correlated according to certain principles of transformation. Thus, although the standpoint of the individual system is taken into account, it is, as it were, cancelled out through its combination with the measurements of other reference systems; so that the laws of nature are freed from dependence upon accidental features of individuality and hold not merely for one system but for all systems.

No less does relativity seem to discount the pretensions of subjectivity in the sense of free choice. For while it is true that we always start from some particular frame of reference which we appear to select more or less arbitrarily, nevertheless the laws of nature determining our results are themselves independent of the choice of our system and, as has been said, hold alike for all systems. Accordingly, choice (even though present) is of no ultimate effect in

<sup>9</sup>Whitehead, A. N., Science and the Modern World, pp. 167-8.

<sup>&</sup>lt;sup>10</sup>Cassirer, E., Substance and Function and Einstein's Theory of Relativity, (tr. by W. C. and M. C. Swabey), p. 381 f. "The theory of relativity... teaches first in the equations of the Lorentz transformation and then in the more farreaching substitution formulae of the general theory, how we may go from these particularities to a definite whole, to a totality of invariant determinations." Cf. Meyerson, E., La deduction relativiste, p. 212.

the general theory in so far as it recognizes no 'privileged' reference bodies, but declares that "all bodies of reference K, K', etc. are equivalent for the description of natural phenomena." For the very reason that the theory aims at universality, subjective choice can exert no decisive influence upon it so long as it holds true to its principle of the equivalent of all reference systems of the laws of nature.

Lastly, nothing surely could be less acceptable to physicists than the notion that the theory of relativity introduces 'minds' or 'monads' into physical science. In professing to discover that free active selves, subjects that cannot be objects, are implied here, Mr. Carr seems to be trying to remove the basis of modern physics to a transcendent world. Indeed, were the universe really composed of minds or monads, any ultimate reason for the existence of physical science would be withdrawn. For monads are 'windowless'; to them 'there is no without': hence science in such a universe would have no world on which to act. Nor is this all. The introduction of monadic conceptions into physics would violate one of the most fundamental postulates of natural knowledge, which Leibniz himself designated as the 'principle of observability.' This is the postulate which forbids physical science to introduce any supra-phenomenal or non-observable elements into its system, recognizing that such a violation of principle would be equivalent to its death warrant. Positively phrased, the principle declares that nothing fundamentally outside the sphere of observation can have being in the physical sense. Yet it is only too evident that the admission of pure subjects or monads as directive forces by physical science would constitute just that surrender to obscurantism against which Leibniz was moved to protest.

But there seems scarcely need for concern on this score; instead of monads, present science would seem to prefer hypothesis indicating an atomic structure of the universe. Not that modern science would accept atomism in any crude sense of reducing the world to a collection of simple, extended particles; but there is a widespread impression that by conceiving solids, liquids, gases, energy, electricity, as aggregates of units or charges, the laws of science can be made to apply to nature more simply and intelligibly than in any other way so far suggested. In line with this tendency there has developed the quantum theory of energy, the atomic theory of electricity, the dynamical theory of gases, in short, the whole kinetic theory of matter, together with a variety of hypotheses in chemistry and biol-

<sup>&</sup>lt;sup>11</sup>Einstein, Relativity: The Special and the General Theory, tr. by Lawson, p. 61.

ogy, where atomistic conceptions may be traced through Mendelianism down to the latest speculations of heredity. In this connection, the opinion of Mr. J. M. Keynes expressed at the conclusion of his Treatise on Probability is worth quoting: that "the practical usefulness of those modes of inference on the validity of which . . modern science depends, can only exist—if the universe of phenomena does in fact present those peculiar characteristics of atomism . . which appear more and more clearly as the ultimate results to which material science is tending."12 Indeed, if atomism be taken in its widest sense as signifying no more than the assumption that nature is reducible to units of magnitude, it seems not too much to say that such atomism is everywhere a postulate of scientific method in so far as science attempts to derive equations, calculations, probabilities,—in short, mathematical results—from the study of nature. Only by assuming something like the atomistic hypothesis, it would seem, can we associate physical states with reckonable numbers and treat them by definite quantitative methods.

In conclusion, the opinion may be reaffirmed that science is not, as Dr. Carr suggests, embracing subjectivism and monadic conceptions, but is on the contrary steadily advancing in the objectivity of its methods and ideal. The important axiom of method is constantly more clearly realized that experimental results are trustworthy in proportion as anthropomorphic elements, the 'personal equation,' and subjectivity (in so far as it defies objective control) can be eliminated. The physicist, the chemist, the zoologist, is, moreover, conscious of studying an object that is no mere extrapolation of his own point of view or projection of the relations in his sensations, but that has on the contrary its basis in universal, necessary conditions over which the private individual mind as such has no determining control.

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<sup>12</sup> Keynes, A Treatise on Probability, p. 427.

#### SCIENCE AND SUBJECTIVITY

By the courtesy of the Editor, I have been allowed to see Mrs. Swabey's interesting article and invited to reply briefly to her criticism of my interpretation of the principle of relativity as being in effect the abandonment of belief in an objective standard and the acceptance by science of subjectivity as its basic principle. I am very pleased to respond, more especially as I find nothing to object to in my critic's presentation of my view. I would like, however, to make my general position clear on the main point, and, that done, to take up the writer's challenge on two positions clearly and definitely indicated.

I am quite aware that to charge science with subjectivity is to most scientific workers engaged in physical research equivalent to charging science with being unscientific. Certainly to suggest that physicists in their minds are revolutionizing science by changing its principle from the study of nature in its objectivity to the study of mind in its subjectivity would be very like a suggestion of treachery. What I have described as the modern scientific revolution is something very different. It is a complete change in the meaning of objectivity which has introduced itself into science without any conscious purpose or directing influence on the part of those who are engaged in scientific experimental or theoretical work. This seems to me extraordinarily significant, and to understand its full significance we have to go back to the origin and development of the modern scientific conception of the physical universe. When we do so we see, not that the physicists and mathematicians today are reintroducing the obsolete concepts of the old metaphysicians, but that they are finding themselves confronted with precisely the same difficulties as those which Leibniz, for example, urged first against the mechanistic principles of Descartes and later against the abstract generalizations of Newton. In a curious way Newton's "Physics beware metaphysics" has turned against his own work, not in the sense that it reveals deficiency or incompleteness in the superstructure but that it concealed from him unsoundness in the foundations.

general theory of relativity has revolutionized Newton's cosmology precisely in the points which Leibniz indicated as its metaphysical weakness. What has had to be abandoned in modern science is the ideal, so strenuously insisted on throughout the nineteenth century, of an abstract objectivity, the assumption of Nature open to the inspection of a contemplating mind and completely free from an entangling alliance with it. The new idea is not merely a recognition that objectivity has a relative and not an absolute meaning and that something of the subject characterizes all scientific knowledge; it is that the reality of the universe has to be conceived on an entirely new metaphysical principle and one which does not dichotomize into subjective and objective factors.

On two points Mrs. Swabey seems to challenge my interpretation of the principle of relativity: viz., my assertion that the principle has negatived the possibility of a standard of magnitudes, and my refusal to see in the laws of nature which hold good for observers in all systems of reference moving relatively to one another an objectivity which "cancels out" the subjectivity of their individual standpoints.

In regard to the first point, I will not ask that the standard of magnitudes if it exist shall be produced, for I suppose it will be generally admitted that it cannot even be indicated. What I imagine, however, is claimed by those who demur to my conclusion, is that the ratio between a small scale phenomenon and a large scale phenomenon, say between an atom and a solar system, is constant and absolute for all systems. This is no doubt true, but by no ingenuity, by no mathematical device that I can conceive possible, can this ratio provide a standard by which magnitudes are determined absolutely. Great and small keep a constant meaning for all observers, not because something they can refer to is absolutely great and something they can compare with it is absolutely small, but because in passing from one system of reference to another the observer finds that all magnitudes conform to the condition of his coordination, the condition that the system to which he is attached is at rest. If we accept the principle of relativity there is no way in which we can compare the magnitudes of different systems of reference with one another by passing from one to another and making observations from within. I do not think there is a real disagreement on this point among philosophers who accept the principle of relativity.

In regard to the second challenge, it is true that the laws of nature assume an invariable form for observers in all systems of reference,

whatever be the movement relatively to one another of the systems. In a way it may be correct to describe this as cancelling out the differences in the observations of individual observers from different standpoints. Cancelling out however does not imply that the differences are abolished. It is in this fact, namely that they are not abolished. that the necessity of metaphysical construction is manifest. The laws of nature are uniform for all observers in all systems of reference. not because there is real identity but because there is a possibility of ideal relations between the observers in the different systems. It is the ideal relation and not the real relation between two observers which enables each to observe for himself under his own conditions and compare with another observer observing for himself under his own conditions. The result of the comparison is as though the two had changed places while in reality each has remained in his own place. For my own part I can only say that I can rationalize the physical universe of relativity on a monadic principle and I cannot rationalize it on any other.

One last remark I would like to make in reference to the quotation from Mr. Whitehead's Science and the Modern World: "it is the observer's body we want, and not his mind." I know that many philosophers and in particular Mr. Whitehead, disagree with my interpretation of the principle of relativity, and generally the nature of their objections is clear to me. In regard, however, to the passage quoted I must confess to complete failure to understand what it means, and as Mrs. Swabey quotes it approvingly I wish she had gone on to interpret it. So far as I understand the principle of relativity, it is that, in passing from one system of reference to another, all the observations of phenomena adapt themselves to the condition of coördination that for the observer the system to which he is attached is at rest. How it can be consistent with this to suppose that the observer's body is in some way privileged and escapes this necessity I cannot understand.

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EDWARD S. BRIGHTMAN, Editor.

## THE MONIST

### THE FINALISM OF PSYCHICAL PROCESSES. ITS NATURE AND ITS ORIGIN<sup>1</sup>

I N order to understand the nature and the origin of the finalism of psychical phenomena, we should consider it in its general relation to the finalism of all life.

Even a rapid glance at the various fundamental manifestations of life discloses their inmost teleological nature. It is manifest throughout, from assimilation and metabolism themselves, the most elementary of all biological phenomena, to the most complex physiological and psychical processes.

Assimilation is a choice. Living substance which is ever destroyed during its phase of functional activity and ever builds up during the following period of reparative rest, selects, from the most complex mixture of chemical substances in solution found in the nourishing liquid, precisely those compounds or radicals or parts of atomic groups which are capable of reconstituting it in the identical specific character which it had prior to its destruction. In so far as it is selection and in so far as it endows living substance with such a property of self-reconstruction which

¹This paper was read at the Eighth International Congress of Psychology held in Groningen, September 6-11, 1926. Its translation from the French we owe to Dr. R. A. Tsanoff. An elaboration of some of the points in this paper may be found in Dr. Rignano's recent booklet, Man Not a Machine (1916) in the series of Psyche Miniatures. With reference to this book Professor D. Fraser-Harris, of London, has written as follows: "This brightly written little book contains the essence of the statement of the anti-materialistic position in biology. It presents in rapid succession the various aspects under which it is impossible to regard the growth of the animal organism as the result of a process from which meaning, purpose and destiny are eliminated. The title scarcely conveys in its entirety the scope or intention of the book. Explain it how we may, the living organism is pre-adapted to correspond with its environment, with a degree of accuracy which can only be conceived of

no other physico-chemical process possesses, assimilation

does offer a very clear finalist aspect.

Metabolism, in its turn, manifests the fundamental property—not to be found in any process in the inorganic natural world (that is to say, in any process which has not, machine-like, been subjected to man's purposive intervention)—the property, namely, of self-maintenance and self-rearrangement in a stable equilibrium. Thus we get this so characteristic property of self-conservation, eminently teleological and found exclusively in living substance.

If we pass to phenomena of generation and regeneration, the faculty of self-construction, revealed thus as special and exclusive in organisms, the "harmony of compoas the outcome of prescient intelligence. If the animal organism is a machine, it is a machine which has developed from a microscopically small egg into a visible assemblage of interrelated parts each predestined not only to fulfill a specific function but to work in harmonious cooperation with every other part, no matter how distant. And not only so, but this extraordinary machine is continually building up its own structure from materials which are chemically quite other than those of its own constitution. Finally, this self-repairing machine is able to reproduce itself, for it can, at intervals, throw off new machine is able to reproduce itself, for it can, at intervals, throw off new and immature machines capable of an independent existence—truly a miraculous machine! Professor Rignano has given the name of "finalism" to his explanation of how those wonderful things have come to be. He is the champion of the teleological position as Loeb was of the mechanical. He lays a great deal of stress on what he calls the "physiological invariance" or "the stable equilibrium" of the metabolism of living matter. This aspect is the counterpart of affectibility or the power to respond to the stimulations of the environment; it is the property of not being the plaything of the environmental forces. Noel Paton and Fraser-Harris have emphasized this vital property, the physiological counterpart of affectibility, under the terms Functional or Physiological Inertia. When the author alludes to physiological invariance and the organism's tendency to remain unchanged (p. 55) he is invariance and the organism's tendency to remain unchanged (p. 55) he is describing precisely what is meant by functional inertia, for he writes (p. 36): "Nothing of the kind happens in the physico-chemical processes of the in-"Nothing of the kind happens in the physico-chemical processes of the in-organic world which, though they remain continually in equilibrium with new environmental energetic conditions, never tend spontaneously to place them-selves in a stationary energetic state, nor to do everything possible to main-tain themselves in it when disturbing agents intervene." Physiologically it is always asking "what is this for?" And when that has been answered, the next question emerges, "How did such an organism or organ come to be?" The next question emerges, "How did such an organism or organ come to be?" The answer of the bio-mechanist is woefully inadequate, however simple and ingenious it may appear. Professor Rignano's position may be given in his own words (p. 42)—"Instead of closing our eyes to reality and obstinately repeating that nothing purposive is met with in the phenomena of new adaptation, and that they can be wholly explained by the properties of dead matter, it is more in keeping with a sound scientific spirit to determine what all those different phenomena have in common and what differentiates them from inorganic matter, so as to explain them with some special hypothesis of life." This short treatise may with confidence be recommended to any one who still holds that modern biology is necessarily materialistic." (Ed.) sition" which the embryo in the course of its development manifests in all its stages, the clearly predetermined end towards which ontogenetic development tends, the aspect which the latter assumes as if it were guided or directed by a sort of occult intelligence or entelechy:—all this impresses these generative processes with a very pronounced teleological aspect which is plain even to the layman's eye.

With regard to the finalism of the phenomena of preestablished adaptation, it is characterized by the fact that the organism, the moment it comes into contact with the outside world and even before the outside world can have exerted any plasmatic action whatever on it, shows itself completely endowed with all the organs and capable of all the functions calculated to assure its adaptation to its environment.

But the faculty of new adaptation has a no less pronounced finalist aspect: we need but reflect that it implies fundamentally an activity resisting all that disturbs the normal physiological state, a resisting activity which no dead matter manifests.

The finalism of the behavior of lower organisms is no less evident in that this behavior always aims at maintaining the little animal in its optimum of environment and in that it is always at the outset a trial and error process, while all mechanistic explanations are puerile and simplistic in undertaking to account for this behavior by means of the theory of tropisms.

Finally, the teleological aspect of the reflexes and instincts of the higher organisms is so pronounced that it is precisely these reflexes and instincts which, perhaps more than any other manifestation of life, have served to give the biologist the impression that the organism is a "machine" each element of which, even the least, must have been contrived so as to vie with all the others in conserving the life of the organism itself.

Well, then, we have succeeded, in our work on Biological Memory,<sup>2</sup> in explaining the finalist aspect of all these various and numerous manifestations of life, by the mnemonic property exclusively peculiar to living matter. Now, the finalism of psychical phenomena is related to the finalism of life in general precisely in so far as it also is of mnemonic origin and nature.

We began by showing the mnemonic origin and nature of the affective tendencies which are the animating dynamic of all the behavior of each organism translated into movements, as well as of all psychic activity in the strict sense of the term.

It suffices, then, to show that all mental phenomena, even the most complex, result from the interplay of these two elementary psychical phenomena, affective tendencies and sensory evocations. Affective tendencies and sensory evocations, being both actually of mnemonic origin and nature, it is evident that if we can deduce from their interplay all mental activity, we shall show thereby that the latter also results, in the last analysis, from the mnemonic property to which these elementary psychical phenomena owe their origin. Precisely this we have tried to do in our work on *The Psychology of Reasoning*.<sup>3</sup>

It is thus, for example, that will we have seen to originate from the opposition between an affective tendency directed toward a future end and another aiming at a present end, when this latter tendency is overpowered by the first. From the opposition between a primary affective tendency concerning a given good, and a secondary affective tendency holding it in suspense for the moment through the fear that, if given free play, it may not attain the desired result, arise, as we have seen, attention, with all it effects

<sup>&</sup>lt;sup>2</sup>Kegan Paul, Trench, Trubner and Co., Ltd., London, 1925.

<sup>&</sup>lt;sup>8</sup>Kegan Paul, Trench, Trubner and Co., Ltd., London, 1923.

of more precise perception and more minute examination of whatever rouses interest at the moment. When the affective tendencies themselves are spurred suddenly and intensively, we see the rise of the *emotions*, while the quieting of their suddenness and intensity produces the entire scale of *human feelings*, down to the coldest *tenacity in action*, a tenacity affective but not emotional, and the more effectual because of the smaller portion of the affective discharge dispersed in disordered and useless visceral movements characteristic of emotion.

Consciousness, in turn, heretofore the greatest enigma of psychic life, has been shown by us to be, not so much an intrinsic property of psychic states as such as a property extrinsic to each of these states, resulting from a certain modality of affective reference which these states present to each other. And we have come to consider the unity of consciousness as being due to the great extension of the cerebral seats of the affective tendencies themselves, an extension which most often renders impossible the stimulating, at each given moment, of more than one affective constellation at a time (save in normal cases of absent-mindedness and in pathological cases of double-personality.)

We have also tried to show, in the aforementioned work, that reasoning is nothing else but a series of operations or experiments simply thought of, and that a reasoning man who thinks "with attention" is animated at the same time by a primary affective tendency and by a secondary affective tendency: the primary is that one which, by means of opportune sensory evocations, imagines and follows "with the eyes of the mind" the different experimental combinations or the various vicissitudes in which the object arousing the particular interest at the moment is mentally involved; while the secondary tendency, which at each stage of attentive reasoning holds the primary in suspense, consists in the fear of attributing to each simply imagined

experiment a result not quite identical with the result which this experiment would yield if actually performed.

We have thus been able to ascertain that the coherence or incoherence of the entire process of reasoning depends on the greater or lesser persisting capacity of the primary affective tendency, while the reasoning itself is logical or illogical depending on the greater or lesser persistence of the secondary affective tendency. This has been confirmed further by the examination of dreams, which are incoherent and illogical owing precisely to their lack of affectivity, and also by the examination of reasonings of subjects gone mad, reasonings which, in monoaffective monomaniacs, are coherent but illogical, while in insane men characterized by instability (maniacs) or impotence (confused) or absence (dements) of affective tendencies, the reasonings strike us, on the contrary, with their incoherence.

From the affective classification, furthermore, arise, as we have seen, the *concepts*, and these serve more and more as a basis of reasoning in its twofold evolution: from concrete to abstract reasoning and from intuitive to deductive reasoning, peculiar to science and reaching its summit in mathematical reasoning.

Finally, we observe the distinction and then the clear separation between objective or constructive reasoning, on the one hand, i. e., reasoning in the strict sense of the term, inspired solely by the desire to know and to discover the truth, that is, to foresee the consequences of given acts, before getting their performance under way, and, on the other hand, intentional or classificatory reasoning, dialectical or metaphysical, whose aim consists in disclosing particular given facts as coming under certain given categories rather than under certain other categories, or in considering the universe as a whole to be such as one would have it rather than such as it actually is.

Thus it is that affective activity (likewise of mnemonic

nature and origin, be it remembered) has seemed to us to impregnate all manifestations of thought. Even more: it is disclosed as being the single and unique fashioner of thought itself which, utilizing materials of an imaginative order stored up in our mnemonic sensory stock, erects all the edifices of our imaginative and ratiocinative mind, from the humblest and lowest structure of common mentality to the most superb and sublime edifice of the man of genius.

Thus we have viewed all intellectual activity as itself also due, in the last analysis, to the mnemonic property of living substance, and as being the most characteristic manifestation of the finalist aspect of life, and likewise the one showing in the most irrefutable manner the absolute incapacity of a mechanistic theory to explain by itself life in its totality.

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# CONTEMPORARY PHILOSOPHIC TENDENCIES IN SOUTH AMERICA, WITH SPECIAL REFERENCE TO ARGENTINA

A N estimate of the philosophic culture in South America can be made by taking the word "philosophy" in either its general or its technical sense. Many historians who have written on the history of general ideas, and particularly when dealing with the history of the Argentine Republic, have preferred to give schematic outlines of the thought inherent in the political and pedagogical ideologies. In this manner of course any civilized country has philosophic activities, since its educational and legal spheres involve cardinal principles of human conduct.

It may be said, moreover, that in South America philosophic thought—even in this sense—has generally been the result of the adoption and application of European philosophic speculation rather than the fruit of a preoccupation with the subject matter of philosophy proper. But in its transmission to these new regions of the world, European thought acquired a vernacular coloring which is in itself of no small interest to the historian. It represents a possession and a hope of South American culture. Thus in Argentina—to take one example—there are elements of thought that are specifically Argentinian, despite their European roots.

Keeping in mind, then, the fact that in South America the prevailing tendency has been to put European thought

to practical application, and using Argentina as a specific model, we may trace the evolution of South American culture under a large number of more or less diverse influences. We may note first of all the Scholastic philosophy dominant during the early period of colonization; then the contributions of French thought during the struggle for national independence; after that, the influence of the European romantic movements of the nineteenth century during the period of constitutional organization; and finally the overwhelming influence gained by positivism during the period of economic development and prosperity.

Positivism has dominated Argentina and South America as a whole during the last forty years. At the present time, it should be observed, the votaries of positivism tend to emphasize chiefly the negative aspect of the thought of Comte and Spencer. We say negative, first, because it neglects the fundamental problems of philosophy, and secondly, because it repudiates—at least in theory—all metaphysical preoccupations, professing instead a vague spirit of agnosticism. Moreover it also has neglected the analysis of the very logic of positivism. Some of those attached to positivism—the more dogmatic ones—have devoted themselves to the metaphysical interpretation of Darwinian biology in the manner of Haeckel. One result of this was the brief Creed of Ameghino—the great Argentinian paleontologist, who in that work makes a bold profession of philosophic faith on the basis of a mystically materialistic cosmology. The explanation of this phenomenon is simple. Haeckel is one of those chiefly responsible for the vague philosophic thought of Spanish America. A noisy and decrepit Haeckelian senility found in its ranks educational scientists and literary psychiatrists, whose pamphlets on "the future of philosophy" constitute valuable documents for the future historian of the philosophic dilettantism on the coast of the Plata.

Positivism, it may be said bluntly, did not produce anything valuable in philosophy proper in South America. It is fair to recognize, however, that it gave some fruit in the domains of the social, juridical and pedagogical sciences, especially under the influence of an evolutionary standpoint understood in the manner of Spencer. Here is reflected the interest in positivism taken as a method—an interest in harmony with Comte's repudiation of pure science and speculative philosophic effort.

But the devotion to fact for fact's sake has given rise in our Spanish-speaking countries to a situation in which science has been in a certain sense the victim of positivism. We have had an over-devotion to the technical truth at the expense of disinterested investigation. Something similar perhaps occurred in the United States. The effect here was not the same perhaps because in this country there was always a ready sense for the Absolute left open by the Puritan tradition, and this was able to feed a future philosophic sensibility. Among other reasons this explains why, contrary to what happened in Spanish America, the United States should have had such conspicuous figures as Emerson, James, Royce and Dewey-transcendental absolutism and pragmatism side by side. It may be mentioned in passing that the introduction of pragmatism into Argentina was itself the work of some positivists who insisted that pragmatism was the logical culmination of English empiricism, forgetting that we have here a school based on an essentially anthropocentric theory of knowledge and generally tied up with religious tendencies. May we not consider pragmatism as a peculiarly North American form of the classical German voluntarism-interpreted, to be sure, in pluralistic terms? Our positivists of pragmatic leanings have not searched so deep-they did not even do this with positive empiricism. This is evident from the fact that they did not get from Spencer more than the mechanical concept of evolution, and they did not learn from John Stuart Mill more than what they read in his Logic. They said nothing about the Examination of Sir William Hamilton's Philosophy, the metaphysical restlessness of which they did not appreciate.

As far as Comte is concerned, he did not do more than inspire a worship for positive reality which his followers in South America never stopped to analyze. Haeckel was more fortunate. It may be said that no university man, no member of a cultural society has neglected to read (in popular editions) The Riddle of the Universe. Haeckel has been given all the tributes of the stationery store. We have already said that Haeckel was one of the major prophets of South American thought. His followers devoted themselves—with great editorial shrewdness—to publishing all sorts of pseudo-scientific outlines of the master's thought, particularly on occasions of vague social reform movements and South American international troubles. In the last few years the homely opportunistic apologies of the Russian Revolution and the new-fangled movement of Spanish-Americanism have given additional opportunities for a large display of the same thing. In this way positivism attracted large groups of university men whose ideologic positions are determined by the exigencies of an economic or a political career.

Fortunately there are at the present time in Argentina evident symptoms of a new philosophic movement, set in operation by an increasing group of young university men who are coming to the philosophic field through the avenues of mathematics, biology, history, pure science, and also through philosophic studies directly. It is interesting to observe that this movement coincides with, if it is not the cause of, a gradual waning of the positivistic hold. It is a movement which has an authentic philosophic restlessness behind it, and which justifies many a hope for the future. It is true that in this coming generation there is a hasty shift from the positivistic creed to the idealistic doctrine by virtue of contagion from philosophic reactions in Europe. Those of us who in Argentina are responsible for the growth of philosophic activities are now fervently hoping that this shift to idealism may not be a mere movement of fashion, and that the visitations to the idealistic camp may prove beneficent in the minds of those who will sooner or later reach well-defined positions on grounds of earnest and reflective convictions.

Not that positivism is altogether gone for the present. But it tends to take the form in which it has been of some historical value in the country. We refer especially to its efficacy in dissolving many a trait of the traditional religious dogmatism. And in this respect present-day positivism goes hand in hand with other doctrines dating back to the eighteenth and early nineteenth centuries which continued to function in the heyday of the older positivism. It is, for instance, notorious that the individualistic rationalism of the French romantic and revolutionary liberalism insinuated itself in the social and political upheavals and constructive organization of the last century. The Argentine constitution—a brilliant specimen of social liberalism—is a legitimate child of that rationalism.

Aside from these political and social currents, the present outlook in South America is also determined by European thought. Among the European philosophers who are at present most influential in South America we should mention Renouvier, Boutroux, and Bergson among the French, and Croce and Gentile among the Italians. All of these have a considerable number of studious readers. A large group of students has felt the influence also of a distinguished Spanish thinker, Ortega Y. Gasset. Senor Gasset recently spent an entire year with us and gave his students an orientation towards Germanic depth, making

by-words for them of such names as Cohen, Rickert, Windelband, and others.

We are not under too great illusions regarding these contemporary influences. We see that these seeds often fall on the rocky ground of positivism and new-fangled views. And this is the problem, the problem of dilettantism in all its forms, that is faced in Argentina by the group of those earnest votaries of philosophy already mentioned. This group of students and teachers, their efforts often veiled in anonymity and shorn of tropical eloquence, constitute, in a sense, the welcoming committee for the European teachers who often visit our country.

This same group has been responsible for several activities which tend to lay the foundations for an incalculable future for philosophy in Argentina. One of the fruits of their work has been the recent organization of the Argentine Philosophic Society. This organization proposes to develop in Argentina some of the forms of philosophic devotion—periodical meetings, systematic publications, invitation of foreign philosophers, and the general co-ordination of the activities of students of philosophy with the activities of those devoted to pure science.

In conclusion, we may say that South American culture cannot be put in too stark a relief, especially if we take philosophy in its strict, technical sense. But to be aware of this does not imply a profession of pessimistic faith regarding Latin-American thought. We have seen that philosophy infiltrated its problems and solutions through the fissures of social and political life, long before there was any direct cultivation of philosophy in South America. And with the present efforts in the field, as well as with the encouragement given to philosophy by the government, there are many reasons for a decided optimism in regard to the future. These peoples, on account of their plethoric vitality and their unsurpassed racial and spiritual liberality, are

perhaps in the most fitting condition to achieve, within the very near future, a philosophic culture free from the traditional vices and capable of offering a vision of the universe and of human life that, in spite of its being an autochthonous growth, will have that which befits a real philosophy—a universal value.

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#### THE METAPHYSICS OF THE INSTRUMENT

#### PART ONE:

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N the frontispiece to one of Blake's prophetic poems, a colored print shows The Ancient of Days leaning from his supernal eminence and circumscribing with huge compasses the boundaries of the earth. Whatever else of frenzied fancy this picture may symbolize, it illustrates a profound metaphysical meaning. For it may be given to a primal divinity to create subject matter with the very instruments which can only be intelligibly used or applied within that subject matter and which logically presuppose it. But man in his workaday practices—if not in his holiday wisdom-must content himself with guiding instruments which mark out and define distinctions in a universe of existence or discourse whose confines, if not irrevocably given, are at least tentatively assumed. The golden compasses in Blake's picture already presupposes the existence of the world, otherwise their efficacy in intelligent construction would be a sheer impossibility. Not even by poetic license can the world be created through a deft masonry of its derivative effects. This then is the first lesson—one suggested and enforced by the pots and pans of domestic economy as by the winged vagaries of a mystic poet. If a tool is a transformative agency it can neither beget nor de-

<sup>&</sup>lt;sup>1</sup>Europe (1794). The theme was probably suggested by lines 224-231 in Book vii of Milton's Paradise Lost. See illustration.

vour the existences it modifies; and if mind is instrumental and efficient in a world scarred with stria of shifting things and events, it cannot have created that world.

#### II

The most general aspect of an instrument is its function as a sign; and like any general sign it possesses three distinct and fundamental references.

- (a) It is an instrument in reference to some thought or intuition responsible for its construction and existence as a tool,—to some plan or mental blue-print which directs its exercise and measures and interprets its effects. Before it is set to work as a simple mechanical device or as part of a more complicated contrivance, a piece of wood or stone is a dull, uninformed thing significant only as an object to be noted and avoided.
- (b) It is an instrument for some aggregate of entities or domain of relations in which it is to be applied. The instrument and the field of its use and activity, or literally speaking, its inquiry, are given together. To the technically initiated this teleological reference to a scientific existential stratum in which it operates, is borne on the face of every implement for which hand or mind reaches out. Genuine instruments are recognized as genuine questions because we know what kind of an answer in terms of things accomplished or possible of accomplishment, would be an answer to them. And just as a question is declared relevant when its presuppositions coincide with what is explicitly or implicitly taken for granted, so an instrument is regarded as relevant when its operating principle conforms to independently existing structural characters.
- (c) It is an instrument in respect and because of its form, arrangement or structure. Its cut and stamp condition the extent and degree of its efficacy in securing a natural leverage in the loam or rock of subject matter. The



'..... and in his hand
He took the golden compasses, prepared
In God's eternal store, to circumscribe
This Universe, and all created things.
One foot he centred, and the other turned
Round through the vast profundity obscure,
And said, 'Thus far extend, thus far thy bounds;
This be thy just circumference, O World!''

WILLIAM BLAKE



more pronounced outlines of its configuration bestow individuality of type while its more minute reticular profile confer singularity or relative uniqueness in the type. Thus a key, to exemplify the three references of an instrument, (a) exists for the purpose of rendering or denying access to certain spaces, powers and prospectively enjoyed things; (b), is efficient only insofar as there are locks and mechanisms which function in a determinate way; (c) and because we live in a world of different houses and purposes, is teethed in a distinctive pattern, so that fumbling at a door in the dark we may distinguish it by sight or touch from another.

These references generate a number of relations highly interesting for philosophical analysis. They show that nature instrumentalized is nature, so to speak, grown or brought to self-consciousness. If metaphysics then be regarded as an account of the generic traits of nature, if the categories which are the basic terms and elements of all scientific explanation and therefore themselves defy explanation, call rather for metaphysical analysis and description, then a 'theory of the instrument', whether the instrument be regarded as a scientific contrivance or a fundamental category, is not only relevant but highly essential to an understanding of the world we live in. For it not only reveals the more familiar surface features of existence but attests and certifies, if we follow its lead as a guiding principle, to the presence of other principles of organization or logical articulation with which the stuff of experience is thickly veined. That it does not find, however, the natural constitution of things locked fast in a complete and closed system is evidenced first, by its very existence-eloquent witness of disconnection and indeterminateness, second, by its concrete failures—proof positive that the cosmic dish is spiced with chance.

Approaching and analyzing the instrument<sup>2</sup> as naively as we can, we shall find that even a cursory examination of its special cast and stuff is not altogether uninstructive. In addition to the quite general deduction that instruments indicate, lay open and close up various discontinuities in some situations, and predict, discover and construct systematic order and continuity in still other situations, more specific conclusions may be gathered concerning the segments and areas of existence thus recovered or revealed. This is true not only in the obvious sense that instruments enable us to dig deeper than we can reach or fly higher than we can see but more so in that the struggle and mode of activity of the instrument tell us something of the compulsive characters of the subject matter in which it is applied and in which it functions. Confront a man with a collection of screws and saws, chisels and levers, picks and scalpels. He does not need to be an expert to keep their uses clear and in the main to infer correctly the different spheres of those uses. He can pick out what will cut wood without splitting it, and what will scrape bone without cutting it. True, we may employ a nail-puller to extract a row of teeth as well as a row of nails but the anatomical similarity of a tooth imbedded in the gum and a nail held fast in a board can be laid down in advance by running our finger over the type of the instrument. A closer glance at two instruments of the same type used for different purposes will generally show mechanical differences. Without dragging in purpose completely at this point, we may say that mechanical re-

<sup>&</sup>lt;sup>2</sup>I have not stopped to define what I mean by an instrument for this paper is really an attempt to give an extended definition of it. But what is said in it will cover Professor Dewev's account of a tool as "a thing used as an agency for some concluding event" (Experience and Nature, p. 128) as well as Reuleux's more technical definition of a machine as a "combination of resistant bodies so arranged that by their means the mechanical forces of nature can be compelled to do work accompanied by certain determinate motions". (The Kinematics of Machines, Eng. trans. by Kennedy, London, 1876, p. 35). For philosophic purposes either one is suitable, both being superior to Rankine's much quoted definition of machines as bodies "which transmit and modify motion and force" (Manual and Machinery of Mill Work, p. 1.)

finements are the earmarks of the discovery of existential niceties just as the sensitive eye and glass of the botanist can see more than the untutored eye of the rustic without impugning what the rustic does see. Instruments give us a clew to the material conditions of their efficacy and these conditions are as unavoidable and objective as the means we adopt to fulfill or modify them. There is no need to multiply illustrations. The razor-edged knife that slices leather and the dull blade that cuts the pages of a book tell the story. Interchange them in use and the blunt bookcutter will sooner find itself with a keen edge, acted upon by the leather, rather than succeed in acting on it; while the hair-fine edge will cut pages indeed but in a manner to make every booklover cry out at the mutilation.

That each material has its own idiom determining alike the generic character of what it can be made to represent as well as the kind of instruments which can be used upon it, is so evident in fine and industrial art that we may miss its import.3 Among the primitives, the use of rigid fibre as a working material not only compelled different types of patterns and designs than those woven with delicate threads but compelled the use of different instruments as well. The repetition of certain designs in Arapaho bead work can be traced to the limitations of the material involved. The peculiar designs on the Maori canoe wrought with special appliances can be accounted for by the nature of the wood employed. The use of stone not only imposes rigidity in architectural designs but demands a method of construction different from the curved surface effects of brick. The skillful tailor turning from creton to shadow lace will change his needle as well as his stitch, and so on.

<sup>&</sup>lt;sup>3</sup>W. H. Holmes in his various works has expressed the belief that most of the symbolism in primitive art can be explained by the presence of certain technical factors, chiefly working materials, which have limited free realistic representation and given definite casts to the processes of conventionalization. See especially "Textile Art in Relation to Form and Ornament, Bureau of Ethnology, 6th Annual Report, also article in 4th Annual Report.

More apparent to a naive view will the instrument appear as revelatory of human purposes. And from this standpoint the inference from instrumental form to the features of the experienced situation taken as a whole, presents no formidable difficulties. The difference between the primitive stone hammer and the modern steam hammer has no essential counterpart in what they crush but rather in the difference of the degree of environmental control which their structures indicate. Our organized purposes, especially in their historic embodiments and deposits, must reveal to a certain extent the nature of the world. Not only in the formal sense that the world is such as to make those purposes possible of conception and realization, but in addition that our purposes are such as to make the world bare its characters and patiently admit of access and exploration.

Perhaps this empirical excursion has been a bit too prolonged. The point was to show that even in the world of ordinary social intercourse, particular instruments are taken not only as signs of instrumental function but as clues to subject matter as well. Bearing more overtly, however, upon the theme of this analysis will be a consideration of what the instrument *ueberhaupt*—the instrument as a *category*—implies for the realities and common subject matter of scientist and statesman, psychologist and man of affairs.

#### III

An instrument is a monument to a felt lack in existence. But it is more. It is a promise of its eventual check and elimination. It imports therefore an attempt to stabilize and fasten for future purposes the probable direction and intent of natural forces and define for physical reference the reliable substantive aspects of natural events. It proceeds to fuse intermittencies and dispersions in subject matter by

disclosing and suggesting certain fixities and continuities. Its successful operation is conditioned by the presence of certain inconvertible properties, persistent runs and irrepressible qualia which exist in their own right. The instrument is responsive to the potential meanings of things in their social effects. No matter how ultimate is its triumph in building highways over land and sea, it cannot thereby wipe out the order which it originally discovered—an order which as human beings, safely cradled in momentary security, we refer to as the fearful dissymetries of primal creation. A bridge spans a gulf or chasm without obliterating it; a lighthouse illumines the darkness without finally dispelling its dangers. Granted that the basic stuff and pervasive features of the world cannot be changed except by law or chance in the course of natural growth, admitted that nature cannot be transformed save by natural means, this only emphasizes the fact that natural means become meanings, glaring or recondite, when mind appears on the scene, and as meanings afford motor power and direction to those changes and transformations we are able to influence. Because the subject matter furnishes both the occasions and limits of its application, the instrument is free to function. Put differently, we may say that any subject matter may have a determinate order independent of god, man, instrumentation or demiurgic force. But when instruments are applied to that order it becomes a significant order. And although 'significance' is not the same as 'order' it can only be found in order.

Since without instruments there can be no objectified meanings, in a sense different from aimless desire and revery, it follows that the existence of certain structural lineaments which condition the possibility and presence of instruments, condition therefore the possibility and presence of the range of meanings. Where instruments are inapplicable or useless there meanings can never be found. In a

world of chaos and irresolvable ambiguities, instruments would be impossible—we could neither understand nor control; in a world of immutabilities and sclerotic characters, instruments would be unnecessary—we could understand but not control. Every tool, appliance or artifice recites a lesson on the nature of the world,-its cross-grained patterns of law and chance, its cosmic humors, its prevailing qualities of the episodic and recurrent. When instruments run smoothly, it is in virtue of ordered recurrences and sequences in what appears agglomerate or fluid; when they buckle and strike a snag then something new arrests our attention, be it no more than the dim perception of the limits of a tried method or a realization of the beginnings of a new problem. Hence, even if all application is risk and life itself a gamble, the existence of mechanical agencies proves that the cards of the universe are not stacked against us, that the game is on for a genuine stake and that there are some exciting hands to be played out before everything becomes extinct in a common doom.

The instrument is prima facie evidence of latencies and potentialities in the concrete contexts to which it is relevant. The recognition of these potentialities whether they be in the form of expressed insights or unavowed acknowledgments betrayed in our conduct and practices, is prelusive and anterior to the existence of the instrument itself, especially of that aspect which is called its formal design. The quickening and developing of these potentialities mark the fulfillment of its purpose. If subject matter is instinct with form in the given situation, the instrument makes these forms intelligible and significant not only by sloughing off the extraneous stuff concealing the precise contours, not only by serving as an index or sign of the human perspective which motived the selection and emphases of these forms, but by enabling these potential forms to perform their definite functions and activities which, metaphysically speaking, define them as forms. Concretions in existence become, so to speak, animated presences because of a way of acting. The instrument, therefore, does not breathe life or a career into a bit of matter but gives it a chance to attain the organized life and activity of a career. There is a sound metaphysical intuition in the myths of primitive peoples in which the soul or spirit or career of a thing is expressed as the mode of its functioning. From this viewpoint a career is never finished as long as potentialities remain unawakened. The career of an instrument consists in making available, extending and liberalizing the careers of other things.

If the instrument has a life work, then in the same metonymous sense it has also a faith. For, as intimated above, the application of instruments beyond the immediate range of their use is attended with varying degrees of hazard. No two excavations face exactly similar difficulties. no two construction problems are exactly identical. It is a blessing then that manufacturers of tools and implements have not closely studied and taken to heart the writings of most modern logicians on induction, for when logic is divorced from existence, inductive inference if not meaningless, as at best an unjustifiable guess. But the faith of the instrument maker is not only restricted to confident trust in the power of his instrument to fathom unknown waters, to light upon nascent possibilities and unravel the matted tangle of things in critical conjunctures. It extends to the belief that in addition to effecting changes in the specific juxtapositions for which they were forged, instruments may successfully be applied to new subject matters and new problems whose kinship with the old have been unsuspected or overlooked. Often the idle application of old keys to new locks or new keys to old locks is followed by a yielding click. The history of invention is replete with illustrations. There is an inspiring moral as well as the color of poetry

and romance in the history of the ship, intended originally to navigate familiar waters, venturing into strange seas, finding new continents and oceans, becoming an Argonaut in search of new vistas and treasures for the hungry eyes of men. The instrument out of the hands of its maker is launched upon a veritable voyage of discovery.

The instrument marks a point at which human interest intersects the natural continuity of the historical process, converting the even flow and existent brutality of natural ends into multiply-implicative foci of rational enterprise. Endings that are natural and casual become ends that are practical and informed. Historical continuities are not thereby disrupted but differentiated and selected. They remain the structural supports in which particularities are embedded, and furnish the relations in terms of which those particulars are defined. But the instrument is the sole key to the incidence of the selection—a selection which although nesting in continuities has never been hatched by them.

The statement that the instrument presupposes a certain differentiation in both structure and function has further metaphysical consequences. It emphasizes the facts of immanent teleology and leads to a reaffirmation of the naturalistic doctrine of Aristotle purified of its ethical expression. It points to the presence of specific temporally coördinated organizations whose natural beginnings and ends make our choice and prejudices intelligible if not intelligent. There must be some kind of natural selection before there can be human selection—and although that human selection is itself natural, it is not natural in respect to the things selected. Unless things desired were the outcome of processes whose stages were integral parts as well as essential conditions of them, we should only be able to dis-

<sup>&</sup>lt;sup>4</sup>Cf. F. J. E. Woodbridge, Purpose of History, Chap. 2; John Dewey, Experience and Nature, Chap. 3.

tinguish the objects of desire by name while instrumental means and efforts at realizing them would be feeble and Instrumentation can be most effective only when the continuities of natural growth as well as our interpretation of them reach certain stopping places or resting points in the light of which, not by the power of which, the direction of the movement seems purposeful, i. e., capable of developing into what it does develop. This manner of understanding purpose may appear naive and obvious, vet it is fundamentally significant in that there is no other way in which we can explain the relation of past and present, and tie the threads between what we know and what we expect. The instrument in all this is doubly selective. It seeks to actualize only those possibilities which are natural fulfillments of the state of affairs it begins with; and from among the possibilities which are naturally relevant, it selects those that are humanly relevant—fulfillments of human preferences. Man's judgments of preference, we have seen, are metaphysically ultimate since they can never affect the natural adaptation of means and ends, cause and effect in the objects preferred, nor can the value qualities of the judgments themselves be derived from the nature of the preferred objects. For if man is not the measure of all things neither are all things the measure of man.

Not only does the instrument presuppose continuity, it manifests in its own history a continuity. Having a growth, it has a genealogy, too. One can hardly appreciate the content of the vast armories of modern instruments save in their relation to earlier ancestral devices. The finest and most delicately adjusted mechanism has its crude forebears. The proverbial difficulty of the Patent Office in distinguishing between an improvement and an invention, besides indicating the imperceptibility that characterizes a kind of organic continuity, suggests in addition that certain types of instrumental function and operation have

remained comparatively invariant although expressed in varying and disparate materials. Dipping into empirical material again, it can be shown, for example, that the methods of percussion, grinding and pressure which the men of the stone age employed in putting an edge on their tools are essentially the same processes, refined and perfected, applied to metal today. The simple ring drill of the Nile dweller does not differ in principle from the modern electric diamond or carborundum drill. The swinging lever with which the Hindoo filled his water vessels grew into the beam engine just as earlier the "whorl" of baked clay became the principle of the spinning wheel. The principles which we inherit as distinct from their customary expression are often our most precious legacy from the past. They bind without enslaving and invite improvement without irresponsibility.

If we desire to trace this continuity still further back, it may not be too fantastic to regard man as a machinate mammal, as one writer did in Erewhon, and the physical machine as a supplementary limb. It cannot be denied that hands, eves and ears serve as instruments for taking, seeing and hearing. Whenever they are ineffective we do not hesitate to transcend the natural limits of reach, audition and sight by introducing magnifying appliances of various sorts. And when these lenses and amplifiers present fragmentary testimony and data—what then? Without any break or sudden leap, thought or inference steps in as an instrument in piecing stray hints together, manipulating things, mentally reconstructing the situation in order to discover what is spatially beyond and temporally remote. Therefore what is true of all instruments is true of thought as an instrument.

A further consideration of the sense organ as an instrument is pertinent to a naturalistic theory of sense perception. The homogeneity of the sense receptors with the

character of the specified stimuli is revealed by the fact that actual defects in the organs of vision and hearing can be remedied only by constructing auxiliary devices in accordance with the laws of light and sound transmission. We cannot understand the structure and functional accomodation of the eyes without some knowledge of physical and geometrical optics. But we do not see these physical and mathematical laws with our eyes. Our visual apparatus does not choose its field of vision any more than the brain chooses the objects of thought. We use our eyes as we do our hands-to grope, to pry, to scan, to escape danger, to signal to a friend. Sense activity, like all behavior generally, is not inertly receptive in the presence of stimuli or explosively active in their absence. It is interactive. The sense organs are instruments of action whose mechanism of operation depends on their structural differentiation, on the selective analysis of the organism and on the characters of the environing media. These are the primary conditions of sense activity, certainly not the objects of primary perception. But there may be psychic blindness and no organic defect in the structure of the eye or sudden change in the physical environment. We seem to see not with the eye only but with the eye as a part of the general nervous system. The eye is the organ of vision but vision is not in the eye.

The sense organs furnish stimuli. When these integrated stimuli are themselves stimuli to thinking they have acquired the status of signs, signals or indicators. Evoking and ordering these stimuli in conscious experimentation enables us to discover the physical and geometrical laws which condition the possibility of their very existence. Where mental operation eventuates in specific results, both the specific signs and mental operations acquire presumptive reliability and in the course of verification are taken as

<sup>&</sup>lt;sup>5</sup>Cf. F. J. E. Woodbridge, Journal of Philosophy, Vol. 6, p. 452.

necessary guides. Logical habits are thus established which are dependent upon facts of natural connection. Here in nuce is the direct intimation of the three-fold reference of thinking as an instrument, to be developed in an article to follow.

Rehearsing a little at this point, we have seen than instrumentalities can never become transmuted into irrecoverable certainties, for their effective application depends upon definite objective environmental traits as well as upon the passing needs and purposes of those who live and react in that environment. Inasmuch as both factors are more or less unstable, reciprocally influenced and *temporally* conditioned, the *conditional* character of not only physical tools but also logical concepts follows of necessity. The history or evolution of the tool can never be the sole factor—or even an important one—in its continued operation.

The instrument is self-critical, correcting itself and making way for nicer and better adapted instances of its kind. It thereby proves itself different from many philosophers, for it follows instinctively and unswervingly the lead of its subject matter, and, instead of balking at recalcitrance, looks to its feelers and mechanisms or retraces its path to try a different tack. Recognizing and accepting the irreducible characters and distinctions in subject matter for what they are, instruments do not fritter away their energies in an attempt to subvert them or forswear tasks on the ground that nature is self-contradictory, whatever that may mean. Although an instrument is engaged in a continual attempt to reduce apparent natural incommensurability, it does not break its teeth on surds but gives up its place to another instrument which is so formed as to take that surd as a starting point and which by operating in rational construction invests it with a rational purport. If the instrument were articulate, it would insist that ultimately all scientific and metaphysical explanation is an exhaustive description of a natural fact, and that to keep on asking "why" indefinitely is more a pernicious verbal habit than a genuine intellectual or practical need. As proof, it would point to a case in its own history. So long as the lever for Aristotle was one of a number of "apories" or contradictions, being an instance in which "small things overcome great things, small weights heavy weights", its laws, which are all the explanation of it we want, could not possibly have been discovered, so that the science of statics would hardly have evolved beyond crude empirical beginnings.

Instruments effect changes and yet are themselves the effects of prior changes and intentions. Examined in the light of its relation to the processes of invention, discovery and manufacture, the relative validity of the distinction between the formal and material becomes apparent. And if the formal be identified with the functional and the material with the structural, then, regarded as events, say as Whitehead uses that term, these distinctions appear as differences in extent or degree of duration and intensity in general spatio-temporal operations. In this connection the traditional four causes or principles take on a different meaning than in the customary interpretation which regards them as certain supplementary forces leagued together to produce natural existences.6 They stand forth rather as aspects and complexions of accomplished things —things as felt, things as understood, things as controlled and things as enjoyed. They are metaphysical distinctions -not ingredients of a magic recipe for begetting individual existences. The efficient principle of the instrument is evident in the motor power which impels it, and in its own mechanical impact which initiates movement, and transmits impetus. Its formal principle appears not only when viewed as a possible object of extravagant ecstasy

<sup>\*</sup>Cf. G. Santayana, "The Secret of Aristotle" in Dialogues in Limbo.

as in the insistent emphasis of some modern aesthetic sects, but in the ideal or pattern tentatively and hypothetically entertained in the fevered mind of the inventor and yet dimly potential in the plasticity of subject matter. Its material aspect is reflected in its individuality, in the fact of its history, in the course of which it is subject to alteration, and in the compulsion it exercises on the ideals of construction and the methods of manufacture. The final principle of the instrument is represented in its business and behavior in the environment. Although these varied features of accomplished existences are indubitable and, if we will, absolute in the concrete schematized case, they do not necessarily imply the presence of unshifting, invariable ontological counterparts outside and above the movement of things. As canons of interpretation or explanation, these principles, although different, are equally true, providing the aspects of the situation to which they have reference are not confused. When I say that the stars are a source of inspiration, I am saying something about them which cannot be affected or deduced by a consideration of their internal structure; and when I am describing the planetary orbits I am not casting a horoscope.

An analysis of the instrument should lay the bugaboo of abstraction, for, if by that is meant the isolation of vector powers and components from a congeries of massed forces and elements, then it can be demonstrated that these disparaged abstractions turn the wheels in mill and factory and stir into motion the giant dynamos of our power plants, all of which enjoy the honorific status of being concrete. Natural sources of energy can only be made available by connecting them in some way with machines. Machines function properly only when they are so constructed that single forces act on the "driver". The required motion in a machine must always be one of an absolutely defined nature, and hence the mechanism must be

so organized that it abstracts from the concurrently operating forces always present. These forces acting naturally apart from human intervention give resultant motions indifferent to the needs of man as an animal, even though their wild play presents on occasions an interesting tableau to man as a spectator. As in the case of the field of intricate social relationships, only by artfully playing off one force against another do we finally get the desired result or motion. Indeed, to indicate the bearings of the argument without further development, many more entities are abstract, in the sense of being derived, induced or selected, than are commonly thought. All of those things which appear in the garb of shining immediacy, whether it be precious stones or metals, the sensations of traditional empiricism, or the sense data which have become the counters and money of contemporary philosophic exchange, are, as Professor Dewey has on so many occasions shown, endterms analyzed out for definite scientific purposes by means of physical or analytical instruments from impure, unrefined and loosely delimited segments of experience.7 The problems which abstractions set are of a purely empirical nature, involved in the ways and means of attaining them and the purposes they express and satisfy. The question of how abstraction can be efficient, or what entities correspond to them, or what "degree of reality" they possess, can never arise until, hypnotized by their polished purity, the methods by which abstractions are reached are forgotten, their earthly origin renounced, and a Virgin Birth invoked to explain their existence.

## IV

Much is being made of communication. Regarded as an unmediated exchange of meanings, it serves as a spring-

<sup>7</sup>Cf. Essays in Experimental Logic, Chap. I; Experience and Nature, Chap. 8.

board for a leap into the supernatural. Yet the indispensable role played by instruments in the communication of meanings is apparent not only in the highly developed apparatus through which we hear, see and write but in the more primitive medium of telling and declaring. I may not understand the sounds a man jabbers at me, and if I am in a far country his ambiguous gestures and grimaces may be more amusing than significant; but when he draws a knife —it is meaning enough. We then have a meaning in common even if it is only distrust. Or he may point to a ship, a cup or a ladder as a syntactical aid in understanding the situation and there is for the moment, a meeting of minds. Meanings on this primitive level are grasped through the intermediation of a physical sign. We thus enjoy the same idea when we partake of something in common. Things can only be had in common when they are done in common or, more accurately, when they prescribe or exact a common behavior, and only therefore because our environmental habits and activities are the same or similar can there be an interchange of meaning. Objects so placed that they can be used as instruments, invite and prompt certain acts. In collective labor, as in lifting a stone or pulling a rope, words become instruments used to render other instruments more effective. On the lowest plane of behavior, words are the shadows of meanings, instruments are their substance

This may not be true of the wider reaches of mental activity carried on in words that have become stabilized signs of meaning. But the almost instinctive prejudice of the unsophisticated that intentions must be judged and justified by "good works" shows what store is set on "carrying out", on behavior. In the give and take of social life, instruments and instrumental activity are accepted as the guarantees of sincerity. Not that what is called inner experience is thereby discounted or denied. We read

one another's diaries convinced that we are not reading fairy tales even though we know perfectly well that they were written for someone else's eye-our friends' if we are modest, posterity's if we are vain. But as regards solving problematic situations, these confessional moments are in the nature of extended reveries. Now reveries tell us a great deal about the world in which they take shape—its lacks and disappointments, its surfeits and boredoms, just as the masks we wear to disguise ourselves are declarative of many things we would keep hidden. But if fancies and reveries are indirectly instructive, they are never directly reconstructive. This emphasis on reconstruction is the differentiating character of projects and schemes, for as programs of reforming and reacting trying to be physically efficient, they must seek out agencies, instrumental lieutenancies and causative powers of some kind. Where reveries are impulsive and show a forward reference, suggesting and subtly persuading that the world has been recast not only in thought but in fact, they become portents of danger and tragedy. Taken earnestly in its stark ultimacy revery grows frenzied and leads to paranoia or dementia. The instrument in situations of this sort plays the part of an indicator and regulator of individual and social sanity. It introduces measure, proportion and correction. Manipulated in subject matter it brings home conclusions about natural intractabilities as no words can. It runs up against an order which it must understand by taking thought of ways and means, or quit. It is a guage of the bearings of meanings, and often a sufficient condition for the creation It implies measurement and therefore inof new ones. telligibility.

As an apparatus for measurement the instrument serves as the safeguard and mainstay of objectivity. It links together a discontinuous series of momentary perspectives by supplying the terms which act as common denominators, and it ties successive or periodic descriptions to a common center of reference, generally the origin and starting point. It prescribes the direction which observations must follow, for upon it are registered the iron clad stipulations which the environment gradually discloses. It minimizes personal bias and causes the tertiary qualities which cluster around the nodal points set up by a kind of telescoping of objects, events and emotions, to evaporate. But it can only do this in virtue of the existence of an underlying order in the flow and vibration of things. Instruments for measuring time, whether it be the flow of sand in an hour glass or the periodic movements of heavenly bodies, imply an order of time; and an order intimately bound up with the movement of things, not with a succession of feelings and affections for which stretches of duration are never equal. Likewise if mechanical appliances enable us to control natural operations and to predict on the strength of what we control, this is possible only in so far forth as there is a mechanical order in nature. In the figure attributed to Galileo, nature can be geometrized only because, "The Book of Nature is written in characters of Geometry."8

The necessary condition for the existence and establishment of that definite order which lends itself to measurement is the presence of a transitive, asymmetrical relation between the objects or properties of any collection. Obviously not all properties can be measured. Everyone deserves the prize at the beauty contest and at Munchausen revivals. Those properties which can only be compared in respect to "more or less" without permitting accurate quantitative measurement are called intensive magnitudes, e. g.,

<sup>8&</sup>quot;I truly believe," wrote Galileo at the close of his scientific career, "that nature is the book of philosophy—a book which is found perpetually open before our eyes but because it is written in characters different from those of our alphabet cannot be read by all. But the characters of this book are triangles, squares, circles, spheres, cones, pyramids and other mathematical figures quite proper to that kind of reading." *Oewres*, ed. Alberi, Vol. VII, p. 355; quoted by Meyerson, *La Déduction Relativiste*, p. 255.

happiness, wisdom, etc., and are much more numerous than extensive magnitudes such as weight, length, etc. The difference between two magnitudes of the latter kind is a magnitude of the same kind which is not true of differences between intensive magnitudes. Put differently, we may say that the measurable properties of a body (leaving aside properties which are examples of derived measurement) are those which are changed by combinations of similar bodies.9 Since the numerical properties of any substance can be expressed in numerical symbols there must be some physical magnitude for which certain associative, distributive and commutative laws hold and which corresponds to the ordered relations expressed in the number series from which these laws are derived. The conditions which determine whether or not any property is measurable are, as enumerated by Campbell: "(1) two objects which are the same in respect of that property as some third object are the same as each other; (2) by adding objects successively we must be able to make a standard series one member of which will be the same in respect of the property as any other object we want to measure; (3) equals added to equals produce equal sums." In all cases the absence or presence of the conditions is discovered by the application of instruments; a yardstick for length, a balance for weight, a clock for time, a galvanometer, usually, for an electric current. These rules or laws, then, can only be established by experiment and cannot be deduced from a priori notions or assumed to hold for one set of properties on the ground that they hold for any other. The demonstration of their existence is at once the most important and most difficult task of experimental science. Without scientific measurement there could be no further discovery of laws, for only when the terms and numerals in which the results of meas-

<sup>&</sup>lt;sup>9</sup>I follow very closely Campbell's treatment of measurement in his *Physics*: The Elements, Part II, the essential points of which are also summarized in pp. 109-151 of his What is Science?

urement are expressed themselves represent expressions of previous experimental laws, can they be taken as significant relations controlling deduction. And so measuring lengths with lengths, gauging weights with weights, and correlating numbers with numbers, we weigh the earth with instruments which are part of it and measure the universe with light rays which are emissions within it, drawing from weak reeds and blowpipes the tones of a measured harmony resident in the nature of things.

The foregoing considerations reinforce the analysis tentatively sketched at the outset. Every instrumental operation, whether it be scientific or artistic, industrial or personal, implies an order to which it owes its existence and an order in virtue of which its ends are realized. The instrument enables us, by utilizing these natural processes, arrangements and termini which antecede and provoke its existence, to create new ends which they suggest and sometimes compel; and to regard in moments of exuberance, the mechanics of transformation as the magic of mind

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## ALEXANDER'S METAPHYSIC OF SPACE-TIME (I)

- W.

HARDLY since the *Critique of Pure Reason* has a work on systematic philosophy appeared which is at once so easy to refute and so hard to dispose of as *Space Time and Deity*. Incidental contradictions are by no means unusual in metaphysics, but in these two cases there are fundamental conflicts of the most flagrant sort. And yet there have been few contributions to modern thought of greater significance than the critical philosophy, whose weaknesses and inconsistencies are the sport of any discerning undergraduate. It would be extravagant to argue that "Space-Time" will have as wide and various an influence as the "transcendental unity of apperception", but its importance will not be small, in our own time and beyond it.

Now contradictions are a genuine blemish to any philosophy, and a situation of this sort demands explanation. In the case of Kant that explanation has been fairly adequately given. His conclusions were in part the climax of one epoch of thought, in part the beginning of another. Daring and complete as was his rejection of old forms of belief, he was never able to free himself from the very ideas his own critical teaching did most to condemn. Like Moses, it was given to him to lead the way to a promised land, but he was too much entangled with the old to enter and possess it. This paper will attempt to suggest a similar interpretation of Alexander's theory. To vary the meta-

phor, here is new wine in abundance, but our author has tried to store it in very old bottles indeed, and it is not surprising that there should be cracks. Perhaps we may yet hear of a "pre-relativist" Alexander to match the "precritical" Kant, and commentaries may be written to analyze and disentangle the conflicting tendencies in this great work. To such an effort the discussion which follows is offered as a prolegomena.

In general, two conflicting metaphysical theories are developed in Space Time and Deity. In the one, Space-Time is the absolute of absolutes. It is the stuff of which things are made, the matrix from which they develop, the medium in which they occur and are related. All its manifestations are conditioned by it, but it is not conditioned by them; it is logically and temporally prior to all finite beings.1 It needs no other thing for its being or comprehension, indeed in the end there is no other thing. It is denied the title of substance only because that term implies a relation and the "One" Space-Time cannot be related to anything.2 Contradictions cannot impugn its absolute validity; for itself is the source and criterion of reality and consistency.3 All relations occur within it but only as parts of the one homogeneous medium, and no relation can ever transcend or condition it. All difference, all heterogeneity, fall within the all-embracing unity, to which any finite being, no matter how complex, is ultimately reducible without remainder.

The type of philosophy thus expressed is very old and very reputable. The Pythagoreans were its progenitors, so far as the peculiarly spatial reference is concerned, as Alexander announces, and in more modern times there is

<sup>&</sup>lt;sup>1</sup>Space Time and Deity, Vol. I, pp. 65, 341, etc. This work will be referred to hereafter as "S. T. D."

<sup>&</sup>lt;sup>2</sup>S. T. D., I, p. 339.

<sup>&</sup>lt;sup>8</sup>S. T. D., I, pp. 206, 257 etc.

<sup>&</sup>lt;sup>4</sup>S. T. D., I, p. 227.

an obvious connection with Spinoza. But the basic tendency is more pervasive than this, and has recently been amply illustrated by some very fashionable physical speculations. Meyerson indeed hails it as the necessary and ultimate form in which our reason expresses itself.6 Thought seeks identities, it works toward the elimination of the variable and contingent, it seeks an absolute. And that absolute seems now to have been found in Space-Time, the absolute world of Minkowski and the misnamed relativists. This unitary being must be treated realistically; it is a genuine object whose constitution accounts for but does not in itself include the diversities of the world about us. So for Thales water was the unitary being, for Descartes extension played the part, and now for Eddington Space-Time is matter and no alien entity need be introduced. Even Einstein, after telling us that "the vague word space" has no physical meaning except as a set of quantitative correlations, now helps us to picture a curved space as if it were something to be looked at on its own account. Whatever concepts are found to be ultimate and unchanging for thought in a given epoch must perforce be treated as the unitary material for reality, the "One" which accounts for appearances, not as their structure but as their stuff and cause. If Space-Time is to go the way of "Force", "Extension" and the equally formal though less intelligible "Absolute Idea" of Hegel, it will at least stand in a great tradition. In physics at the moment there seems to be a feverish attempt to explain all possible physical properties of bodies in terms of some peculiarity or other of the spacetime continuum. It is not unnatural that the philosopher should try the same experiment in dealing with his prob-Thus when Alexander "deduces" the categories from the structure of Space-Time and derives the cognitive

<sup>5</sup>Cf. Alexander's Spinoza and Time.

<sup>&</sup>lt;sup>6</sup>Meyerson, La Déduction Relativiste, especially Chapter 5 and following.

relation from the same source he is not lacking in precedent,

either physical or metaphysical.

Yet there is another view about Space-Time and its philosophical status, far too infrequently recognized in spite of Whitehead's great work on the subject. Space-Time is here a "locus of relational possibility", a strictly formal and relational affair. So far from being complete in itself or portraying an absolute world, it is the witness directly or indirectly to a three-fold relativity. (a) Space-Time as a uniform and relational structure is relative to the concrete events it relates. To take it as complete in itself is to commit the "fallacy of misplaced concreteness",7 to treat certain pervasive and physically important relations between events as though they constituted the events themselves. The fact that Space and Time are relative does not mean, as with Minkowski, that they are "shadows" of a whole equally abstract but less variable; it means that spatial and temporal relations may be variously abstracted from the concrete durations whose relations they express. Space-Time expresses the correlation of such differences, it is the fact that different motions, and hence different time series, are uniformly related. (b) Events themselves are reciprocally related to their structure. The spatio-temporal relations do really differentiate events themselves, and are not something additional to them. For events are the very apparent world around us, not something with a prior and exclusive nature of their own. And thus, while the world is not Space-Time, it is genuinely and indubitably spatio-temporal. These features belong to it relatively, but they do not genuinely belong to it. And (c) an ultimate heterogeneity must thus be recognized. No "bifurcation" which separates off appearances from reality can do justice to the infinite complexity of the real as thus

<sup>&</sup>lt;sup>7</sup>Science and the Modern World, p. 72 and following. The chapter on "Abstraction" in the same work gives Whitehead's clearest statement of the relational character of Space-Time.

interrelated. The world really is full of a number of things, and the reductive tendency which would subordinate them to a prior unity is no less destructive of Space-Time in its legitimate meaning than of qualitative differences. The whole, if Space-Time is to be our model, can only be a synthesis of differences, and relative to them.

Now there is a sense in which Alexander would accept each of these propositions, incompatible as they seem to be with the absolutist view to which he is so clearly committed. (a) The relativity of the structural elements of Space-Time to something more concrete is clearly recognized. For Space and Time as "frameworks" are abstractions from concrete motion, and of such motion we learn that it "is not a succession of point-instants, but rather a pointinstant is the limiting case of a motion."8 These abstractions are said to be "blank" in themselves, and in subordinating them to something more substantial, Alexander thinks himself at one with Whitehead in their "common devotion to the concrete". (b) This relativity is the condition for the very existence of Space-Time, and only as differentiated by "lines of advance" or motions, is it intelligible. Hence relativity means more than the subordination of Space and Time to something more concrete, to something "primordial and given in experience", it means the relativity of the ultimate "stuff" to a relational system. For Space-Time does not exist just anyhow, it exists and is intelligible only as a system of perspectives, a highly differentiated and complicated system. This differentiation constitutes Space-Time as a continuum of "togetherness and distinctness" and only so is it metaphysically acceptable.9 (c) Never was "bifurcation" more explicitly rejected. Not only is "total Space-Time" a synthesis of irreducibly different perspectives, but on the level of knowl-

<sup>&</sup>lt;sup>8</sup>S. T. D., I, p. 321. <sup>9</sup>S. T. D., I, p. 44 and following.

edge all appearances are to be accounted for objectively. Relative they are, but a spatio-temporal world includes and accepts such relativity as of its own nature. If knowing appears as a form of compresence, it is because compresence from the start has been characterized by just that sort of relativity which is essential for knowledge. Instead of a unitary being which annuls qualitative difference we have "the system of the many in which they are conserved not the vortex in which they are engulfed." 100

Can these two views be reconciled? The contention of this paper is that they cannot, and that the paradoxes of Space Time and Deity follow from an unholy union of opposing doctrines which neither metaphysics nor eugenics can sanctify. The investigation covers three fields, "pure" Space-Time, the categories and the theory of knowledge. The argument is identical throughout. In each case we have an initial recognition by Alexander of all that is central in the case of relativism. But that is never enough. This relativity must always be accommodated within the limits of a preconceived absolute whose unity it flatly contradicts. Hence an attempt, inevitably a failure in the end, to combine such relativity with a type of unity which excludes it. The oddities of Space-Time and the major categories and the division of "knowledge" against itself, follow directly from this unhappy combination. Finally the discordant elements fall apart and the absolutist view triumphs, but only at the expense of all that was best and most original in the theory as a whole. That this result should be taken as all that Alexander's thought has to offer would be a real misfortune. In the course of his argument and especially in the theory of the categories, Alexander has made great contributions to contemporary metaphysics. If these are to be of permanent value, however, they must be defended against just this absolutism, equally

<sup>&</sup>lt;sup>10</sup>S. T. D., I, p. 347.

and disastrously characteristic of the hypothesis in general. Such a defence it is now our purpose to attempt.

## I. THE STRUCTURE OF SPACE-TIME.

Why Space-Time? Alexander has the unique distinction of presenting the first important metaphysical justification of such an entity. The argument proceeds from the nature of Space and Time themselves, not from conventions in regard to measurement, which Alexander regards as quite secondary and even misleading for philosophy. And that argument is rooted and grounded in relativity. The intrinsic inadequacy of each entity in isolation is the proof of their connectedness. Space could not be what it actually is, a continuum of parts, if it were "mere" Space. would "bare" Time be the empirical Time we know. The argument is altogether similar in principle to the idealistic justification of a "real will". Space and Time are only fully themselves in a context which negates their isolated self-sufficiency. And as surely as Space and Time are real, so surely must we trust in their connection, for without it they could not be real.2

The unfortunate reticence of our author as to the basis of such inadequacy has made this position appear less formidable than it really is. Space "as such" is without distinction of parts. But what about the mathematically immaculate continuum with which Mr. Russell and his followers have made us familiar and which is supposed to solve all the old antinomies about Space? Again, Time is held to be discontinuous because "present" excludes past and future and is incompatible with them. But, as Mr. Broad inquires, why not treat the series of instants as a whole, like the notes in a melody? The reply, which Alexander has only suggested, is along the following lines.

<sup>&</sup>lt;sup>1</sup>S. T. D., I, p. 87 and following. It is misleading, of course, only so far as it suggests an ultimate relativity which Alexander by no means accepts. <sup>2</sup>S. T. D., I, p. 46 and following.

The continuum of points must have some connection with empirical extension. But extension itself is not resolvable into such points, there literally are no least and no greatest parts. For whole and part in extension are thoroughly relative; there is no whole not itself part of a wider extent, no part not itself a whole with reference to further subdivision. For the nature of extension is to be whole of parts and the parts of extension are themselves extended.

True enough, as Whitehead has shown, the requisite points can be derived from empirical data, but not from extension merely, as he now explicity recognizes.4 "Cogredience", rest and motion, and the intersection of distinct time systems are requisite and the distinction is thus clearly spatio-temporal. When we are told that "Accordingly, position, planes, straight lines, parallelism, perpendicularity, and congruence are expressive of the mutual relations of alternative time-systems",5 something of the empirical basis for Alexander's contention can be seen. Similarly, as McTaggart has shown, a completed time series must have some connection with the transition of future. present and past, or else it will lack any specifically temporal character. And yet the two are radically incompatible. If you take Time as a completed series of instants there is no transition within it, the elements are either all or none present in the same sense and the distinction of past and future does not exist. Nor is there a shadow of transition within your series. Yet if Time be not transition, change of relatedness, it is nothing.

The paradox has an obvious basis. In the case of both Space and Time there is a formal or relational and a material element. There is no element of concrete Space which is a mere limit, nor could extension be compounded

<sup>&</sup>lt;sup>3</sup>Mind, N. S., Vol. 30, p. 35. <sup>4</sup>In the supplementary notes to the second edition of The Principles of Natural Knowledge.

<sup>8</sup>The Principle of Relativity, p. 9.

of positions. So the series of instants does not change, while experienced duration is transition itself. Points do not extend, instants have no transition. Stated in this form the argument seems trivial, but it is not. For any attempt to telescope these contrasted elements, to say that Space just is a combination of points or that the series of instants is all there is to Time, will run into precisely these difficulties, as past antinomies show. Nor is the connection immediately obvious. Having distinguished points from extension and instants from duration, how are we to connect them? It will not do to omit either at the expense of the other, yet they are not immediately compatible. That they can be reconciled in a wider context, and especially in the relation of Space and Time to each other through motion, is a suggestion which Alexander shares with Whitehead and which the latter has verified in a most impressive fashion. Grounded upon a full acceptance, without bifurcation, of the empirical characters of extension and duration, supplemented by a search for the relational context in terms of which their formal structure can be understood, it offers an admirable starting-point for a theory of Space-Time.

And the further specification of this connection is equally promising. Having treated points and instants as abstractions, we are not to reach the concrete reality by putting them together, after the manner of Hegel's union of being and nothing. Rather Space-Time is primarily motion and the formal elements are derivative from it, not the reverse. A series of "sections" of Space, each occupying an instant of Time, is a convenient structure for certain purposes, but the concrete reality is to be thought of as a series or synthesis of historical phases. And such phases are *perspectives* "Space at any moment is full of memory and expectation", and only real motions can secure this connectedness, motions which are not compounded of dis-

<sup>6</sup>S. T. D., I, p. 71.

crete now's each complete in itself, but in which each element is integrally bound up with the past from which it has developed and the future which is beyond it.

Such perspectives are the essential nature of Space-Time, for in it the togetherness and distinctness which fell apart in Space and Time as such are genuinely united. Any perspective is unique, for it mirrors the whole Space-Time from a distinct center of reference; it is thoroughly relative to this particular context and locus. Yet the connectedness is no less genuine. For a perspective is determined by motion, it is on a line of advance, and its very relativity is the fact of its relatedness, of the thorough interaction or compresence which is the essence of Space-Time. "A perspective is merely the whole of Space-Time as it is related to a point-instant by virtue of the lines of connection between it and other point-instants." Thus perspectives are "realities, and physical realities". In a series of "sections", this essential relatedness is left out, for the unity of motion is dissolved into the formal deficiencies of Space and Time in their isolation. In a world of perspectives events are together, but not blankly, for each relates itself to the rest from its own standpoint, each enters the community of interactions from its own unique position. As Alexander puts it, each will have its own set of dates for events, it will be compresent selectively, with the whole of Space-Time. Again, in such a world events are diverse. but never disconnected, for their very diversity is itself a function of their relatedness. To be relative is to be related. and this relatedness is the structure of Space-Time.

This insistence upon perspectives is extremely significant. The notion became fashionable with the theory of relativity because it registered the fact that the relative does make a difference in the structure of Space and Time.

<sup>&</sup>lt;sup>7</sup>S. T. D., I, p. 77.

<sup>8</sup>S. T. D., I, p. 92.

Nobody denies the fact of relativity, but the Newtonian theory had it that such relativity must simply be substracted to reach the reality. Absolute motion is that which remains when the effects of all relative motions have been eliminated. Perspectives do exist, but from the standpoint of objective and absolute reality they are irrelevant. On the contrary, the theory of Einstein shows that only in a context, with reference to a given standpoint, have Space and Time any physical meaning. And Alexander has carried the argument much further. If he is right, only as "stratified" in perspectives have these entities a metaphysical meaning. For only so is the requisite character of continuity achieved. And this relativity and diversity are ultimate. You cannot reach an absolute by omitting these diversities or "transcending" them. For then you are left with blank sections and, as our author rightly insists, "An integration of such sections does not represent the history of the world. Time would cease to be a duration and would be nothing but a now, for the different nows would have no continuity." Space-Time, then, requires this specific differentiation in order to exist, and if this be denied the whole hypothesis collapses. The repetition of this fact may perhaps be excused, in view of the part it is to play in all that follows.

Finally we must notice the specific manner of the salvation of Space and Time. Time distinguishes Space because in a perspective the points of Space are variously dated. Extension is no longer the final fact, but motion, and such motion involves temporal differentiation not only within its own sequent phases, but in reference to other motion. Alexander's favorite instance is the velocity of light and the relativity in dating consequent upon the discovery that light moves. Obviously, from a given center, points will be variously dated if allowance is made for the

<sup>&</sup>lt;sup>9</sup>S. T. D., I, p. 67.

time it has taken a "message" from them to reach the center of reference. Interaction of this sort, the giving and receiving of news, does in fact establish such a variety of dating, once it is recognized that the standard of reckoning is determined by the specific relations of the center of reference to the events in question. Thus the diversity in relations of different motions or lines of advance is the salvation of Space, whose points are differentiated accord-

ingly.

This same connection comes to the rescue of Time. If an instant were absolute, if it contained no reference to past and future there could be no connection intrinsically. But in a perspective which is spatio-temporal, the present is intrinsically determined by its past and future, that is, by the motion of which it forms a part. The continuity of motion from which it is an abstraction, saves Time, just as the diversity of relatedness rescues Space. And this continuity is reflected in the fact that a perspective is determined by past and future as well as present and hence Space is full of memory and expectation. The dependence is reciprocal but not, in this form, vicious. For each entity depends not upon the other as an equally barren abstraction but upon the concrete context in which each finds its meaning and justification. Hence our three-fold relativity, now recognized to be as ultimate as Space-Time itself. (a) The relativity of Space and Time as formal to the empirical reality whose essence is motion, (b) the relativity of spatiotemporal reality as a whole to the diverse perspectives through which alone it can be accepted, (c) the connectedness of all events within the whole in virtue of the concrete interactions of which perspectives give us the structure. The solution, so stated, is by no means as definite as could be desired but, in principle, it meets the absolutist difficulty which was its raison d'etre.

Yet all this is somewhat less than half the story and,

taken by itself, quite misrepresents the total theory. It has seemed essential to isolate it because it does present an intelligible and important theory upon which Alexander certainly does insist and without which his hypothesis could not stand for a moment. But absolutism will out, and each of the principles thus for enunciated is quite specifically contradicted in the sequel. The manner of this contradiction and its consequences must now claim our atten-

Summed up in one sentence, the Alexandrian account rests upon an initial and exclusive absolutism which comes perilously near to making nonsense of all that has thus far been asserted. It appears to eliminate absolute Space and Time by the introduction of perspectives, but it never for a moment does so. The relativity of Space is never even contemplated, that of Time, very oddly introduced, is completely superseded. Motion is prior to Space and Time. we have heard; now motion proves to be just a change in date of spatial positions. Date and place depend on interaction, but such interaction consists in the odd peregrinations of Time through pure Space. Points save Time but are themselves permanent only as recurrent in Time. order that Time should linger, Space must recur."10 that our author has offered with one hand he withdraws with the other. And the result is this. "Time and Space in their ancient pure reality remain as the framework of history, and the new doctrine (relativity) is a new doctrine of their sensible measures." Or this, "The universal Time is arrived at by depersonalizing the perspective times of many persons, that is, correcting the illusions to which they are subject."12

First, consider the fate of Motion, upon which the whole theory was based. If Motion is itself a name for concrete

<sup>&</sup>lt;sup>10</sup>S. T. D., I, p. 49. <sup>11</sup>S. T. D., I, p. 91. <sup>12</sup>S. T. D., II, p. 232.

motions, a function of events in their dynamic connections, then the spatio-temporal connections derivative therefrom are ultimately relative. Space-Time is the structure of something extrinsic, it is form but not stuff. In absolute Space-Time, this must not be. For while Space and Time require each other, they cannot require anything further; in their combination they are ultimate. So capitalized "Motion" is merely another name for the fact that this self-sufficient continuum of points and instants is considerably scrambled within itself. Points occur at various dates, and vice versa, and this combination is Motion, the concrete entity from which Space and Time are abstractions. "Now this is the meaning of motion. Points do not move in the system of points but they change their time coefficients."13 And again, "The meaning of motion is that the time of a point ceases to be present and the present is transferred to another point continuous with it." And of material bodies: "their motion merely means that the time-coefficients of their spatial outlines change."15

The absolute structure of Space-Time is thus clear. Absolute Space is presupposed from the outset. The meaning of "point" is presupposed, and, as we have just seen, the relations of points to each other never change. These points are "occupied" by instants, and variously occupied. and this is the meaning of relativity, that the points in Space are traversed by distinct lines of advance, which are movements of Time itself. It is the series of instants itself that moves, and what is differentiated is not concrete extensions but the "system of points" whose ultimacy and spatial distinctness is presupposed from the start. The concrete reality, the ultimate substance is a point-instant, or "pure event" which is the occurrence of a point at an

<sup>&</sup>lt;sup>13</sup>S. T. D., II, p. 232.
<sup>14</sup>S. T. D., I, p. 272.
<sup>15</sup>S. T. D., I, p. 65.
<sup>16</sup>S. T. D., I, p. 272 and following.

instant and the occupation by an instant of a point.17 It is the point that occurs, the instant that occupies a place. The fusion of abstractions is complete, pure form and pure stuff coincide and are absolute. Space-Time is not relative to Motion for it is Motion. Internal vagaries there are, but they are all family affairs. Points are comprehensible as soon as we know that instants occupy them, and instants are no longer abstract because they have somewhere to occur. One abstraction would be ruinous, as Alexander insists, but given two abstractions the puzzle is solved. Points must be the places of something, and so indeed they are, of instants. Hence they play form for the substantial occupancy of Time. Again Time demands the occurrence of something and here it is, the point. Space is the substantial occurrent, Time the structure. And thus is accomplished that union of form and stuff, of relations and things related, which is the heart and center of absolutism. Hegel loved to remark, one hand washes the other. The combination is Motion and hence both Space and Time are relative to nothing but their own combination, and the ostensible results of relativism are reconciled and subordinated to the absolutes of Newton, whose "ancient pure reality" remains unimpugned.

The consequences are immediate and devasting, and our author has developed them with relentless accuracy. The unity of identity and diversity has been accomplished by making the absolute diverse from itself, and this is a contradiction. That Time and Space should be variously determined in distinct contexts is one thing, the diversity is then explained by a plurality of relationships. But when these relations are solidified into things themselves,

<sup>&</sup>lt;sup>17</sup>S. T. D., I, p. 48. "It follows that there is no instant of time without a position in space and no point of space without an instant of time. I shall say that a point occurs at an instant and that an instant occupies a point. There are no such things as points or instants by themselves. There are only point-instants or pure events."

when form is merged with stuff, the very being of such entities is at war with itself, as will be seen.

Consider Time. It is an order of instants, a one dimensional affair. It is now suggested that there may be a number of such series, but the order within each is not contested. But for Alexander, Time is more than a serial order, it is a set of occupants which are situated in Space in the same literal fashion as tables or houses. Hence the embarrassing task of relating instants to each other in respect of their spatial position, a task which our author by no means shirks. (a) We are told that in this meta-physical aspect. Time does not constitute an additional dimension, as the relativists suppose. "Time, with its distinctive features corresponds to the three dimensions of Space, and in a manner of speech, Time does with its one dimensional order cover and embrace the three dimensions of Space, and is not additional to them. To use a violent phrase, it is spatially, not temporally voluminous."18 A one dimensional order could not be voluminous in its own right, to be sure. The violence is clearer when one says, "Time is spatially, not temporally ordered." The reason is plain. Occupants of Space do not possess dimensions of their own but those of the positions they occupy. A table is spatially, not "tabularly" extended. To say that a series of instants is not an additional order to the three dimensions of Space seems violent indeed. The boldest relativists seem to believe that the temporal dimension is not different in character from those of Space, but they recognize it as additional as a matter of course. But here Time is no longer form but stuff, a set of occupants, not a series of positions and hence "Metaphysically-it is not a fourth

<sup>&</sup>lt;sup>18</sup>S. T. D., I, p. 59.

dimension of the universe but repeats the other three."12

The manner of this connection is further set forth in the baffling demonstrations of the interdependence of temporal relatedness and spatial dimensions. In themselves, these arguments are almost incomprehensible. Considering the status of Time on this theory, they are quite disastrously clear. It is assumed throughout that instants, like any other occupants, derive their relations from the positions they occupy. Hence their relation cannot be irreversible, transitive and the like, unless their spatial positions warrant it. Take irreversibility. In one dimension no instant could occur at more than one place without being at a different position and, so far as can be seen, that repetition might place it actually after (in front of) its other spatial position. And then it might perfectly well, in this new position be after (in front of) an instant which it was before (behind) in the other position. And then A, being after B, would also be before it, and the temporal order would be irreversible. Q. E. D. All this is made plausible by the fact that the same line is used for spatial and temporal positions, "we take the line ab (the series of points)—to represent the time line as well"20 and thus in fact the position of an instant is that of the point it occupies. The addition of a second dimension is quite vain. It is supposed to save the situation because the instant can occupy a point here without being either before or after (spatially) its spatial position in the first dimension. And since the spatial dimensions are independent, the contradiction is solved. It is before in one relation, after in another. But either the second dimension is temporally independent of the first or it is not. It must be if we are to

<sup>19</sup>S. T. D., I, p. 59. In his reply to Broad, Alexander seems to repent this assertion. He still insists upon the demonstrations of the connections of Time with the three dimensions of Space, and these would be meaningless without it. Hence the general position is not altered, though there is some natural uneasiness as to its consequences.

<sup>&</sup>lt;sup>20</sup>S. T. D., I, p. 52.

follow out the identity of spatial and temporal relations on which the whole argument is based. And then it will be simply irrelevant to the first and that series will lack irreversibility as much as ever, while we will have the distressing notion of right and left time upon our hands. If it is not, then an additional spatial dimension will not clear up the fact of temporal sequence in any sense. In either case this fact remains. If the order of Time is made into an a priori stuff occupying Space and deriving its relations from positions occupied, then no instant can occur at more than one point without being either before or after itself, which flatly contradicts its own relational character.

Without a third dimension Time would not be transitive. It might change its direction. "The movement of Time might be pendular, and a movement might be from A to B and from B to C and both irreversible, but that from B to C might be in the opposite direction in spatial representation. It would not in that case necessarily be true that if A is before B and B before C, A is also before C."21 The dilemma here is plain. The pendulum has undoubtedly swung back in Space, but just as clearly that does not affect our reckoning that its return is later than its departure. If it did a pendulum clock would be a very poor means for keeping time. Yet if temporal relations are those of positions in Space, this conclusion is unavoidable. We are in the sad predicament of being unable to return to our offices tomorrow morning without thereby returning to vesterday. The thing simply will not do. There is a temporal order of events, and the positions in that order cannot be substantives occupying positions in and deriving their relational characters from another order with incompatible characters.

To sum up. (a) There are three dimensions of Space and only one of Time. Hence the relations of instants in

<sup>&</sup>lt;sup>21</sup>S. T. D., I, p. 51. Repeated in substance in I, pp. 54.-55.

different spatial dimensions is very odd indeed. Alexander seems to contemplate a series of instants swerving about in three dimensions, for lines of advance, which are the movements of Time, are spoken of taking place "in all directions" and being "not necessarily straight".22 And this is not plausible. That Time and Space should vary together in different contexts, or rather that positions should be variously determined in different relations, is one thing; that independent sets of instants should run about in an identical Space and even collide23 is quite another. (b) A line that does duty for both Space and Time gives a one-one correlation of points and instants. This contradicts the empirical fact that an instant may be common to a considerable spatial extent without prejudice to its temporal relations. (c) The order of instants is irreversible, the order of points is not. To identify the two is to secure a series with contradictory characters, to refuse to identify them is to reject that fusion of distinct relations in an absolute stuff which is the basis of this theory. Substantialized Time has become diverse from itself.

With Space we can be more brief. As we have seen, the role of Time here is to differentiate positions. For Whitehead this would mean that there is a plurality of time series, each with its own set of coexistent spaces, and that points within a given space have different positions in virtue of the relations of this time series to others through relative motion. But this depends upon an ultimate plurality which Alexander will by no means admit. In spite of all that has been said about perspectives, all times must belong to a single time series. All times are parts of the "One Time" in the same simple sense in which instants are part of a single series. In reply to Bradley, the hypothesis

<sup>22</sup>S. T. D., I, pp. 69-70.

<sup>&</sup>lt;sup>23</sup>S. T. D., I, p. 63. This is only an anology, to be sure, but Alexander does not appear to regard this particular consequence as a defect.

of distinct time series is categorically denied. "Thus when Time is regarded as it must be spatially, there are no Times which do not belong to that one Time, belonging as they do to the one Space." In this container all differences are together, like marbles in a box, and thus there is but one Time. How then provide for the requisite differentiation? One space cannot be diverse in date from another space, for there is but one, nor can this one be differentiated into a series of coexistent spaces. That was the notion of a section, abandoned at the outset. Space "now" must be temporally differentiated within itself, not in extrinsic relations, for it has no such relations. If points are made distinct by instants, then either there is no distinction with a "momentary" space, or that momentary space is, within itself diversely dated. The latter alternative is chosen.

From a given instant of reference, Space will be at different dates, since if "Now" be the given instant, most of the events whose influence makes the center "compresent" with them, are not "now" but past or future. My perspective is determined by interaction and interaction takes time. Hence compresence does not mean simultaneity but a variety of dates. The best instance is that of the star Sirius.

"What I see is an event which happened nine years ago at the place where I see it—and heaven knows what may have happened to Sirius betwen the date of what I see and now when I see him." So much for past points "now", what of the future? "I mean by thinking of Sirius and his position in the future that there is a system of transactions now begun which will end by enabling me to see Sirius then. Generally, the point c is future to the point o in that transactions in Space-Time are set up which will enable me at some future time to date c as contemporary with my present moment." Now it is fairly plain that

<sup>&</sup>lt;sup>24</sup>S. T. D., II, p. 235. <sup>25</sup>S. T. D., I, pp. 70-71.

something is wrong here. I now see Sirius as past, that is, as not contemporary with my act of seeing it. I think of it as future in that transactions are "now" set going that will enable me to date it as contemporary in the future. But, according to the argument, I will not date it as contemporary then but as nine years past, while the Sirius that will then be contemporary on that system of reckoning will be dated as nine years in the future. We are in the position of Alice in Wonderland whose wages from the Red Queen were to be jam vesterday and jam tomorrow, but never jam today. Each reckoning depends upon our taking the other as "now" and then denying it in the sequel. And thus indeed Space is variously dated. Alexander has urged us to be serious with Time, but it does appear that in this instance he is refusing to be serious with simultaneity, and with Sirius.

Nor is this a special instance. Some time discrepancy would hold for even the most contiguous objects. Unless such discrepancy existed the requisite distinction would be lacking, but to maintain it we must accept throughout the very confusion here noticed. This hypothesis must be clearly distinguished from that of the relativist. For the latter a perspective expresses a diversity of relatedness in that all perspectives do not fit together into a unique and absolute whole. There is then a diversity between perspectives, but within each a single standard is employed. Not so here. The relation between perspectives must be simple and unitary, they must fall within the one and absolute Space and thus achieve temporal unity. Yet the original hypothesis demanded diversity, hence it is sandwiched into the perspectives themselves. A double meaning of presentness is telescoped into a given system of reckoning and then both meanings are ignored so that we may have "past" and "future" now. Relativity is here not a relational unity of diverse standpoints but a diversity of

standpoints holding directly within a substantial unity. Sirius is past and future now, but only past if never future in the perspective and only future if never past, and only called either when the coexistence of the star on one reckoning or the other is assumed from the start. And this coexistence is just what was denied by the supposed diversity of dates.

Finally, consider Motion. Since all such motion is nothing but temporal progression, "a forward dating of points of Space in Time", we have the embarassing problem of the relation of movements in Time on our hands. One would normally suppose that temporal progress was consistent with rest in Space, so that one might remain in the same place and still grow older. Not so here. "Rest, in fact, appears to be purely relative and to have no real existence. Every place has its time-coefficient and is the seat of motion. For if any point in space retained its time, this would dislocate the whole system of lines of advance within Space-Time, a point being only a point on such a line."26 If any point retained its time, that is precisely what rest must mean if any motion is identified with temporal progression. Hence a new triumph for the tortoise in the now familiar contest with Achilles. For it need not even leave the starting point, provided that it keeps the same time as its competitor it will move in precisely the same sense. Its position will have later dates, and that is motion. Achilles could only outdistance his opponent by beating him to tomorrow or next week. And in that case there could be no temporal comparison. Again the same moral. If you substantialize the order of Time into the motion it measures it is no longer a standard. Unless the motions in the contest were different there would not be a race, unless there were some common standard, whether temporal or spatio-temporal, there could not be a verdict. By

<sup>&</sup>lt;sup>26</sup>S. T. D., I, p. 84.

telescoping the two into a single entity your absolute becomes once more identical in precisely the sense in which it was different. And that is self-contradictory. Again the relativist position is quite distinct. That the same motion may in different contexts function either as purely temporal or as motion in Space is one thing. That it is as such and in itself both at once is quite another.

The continuity involved in motion was to be the salvation of Space and Time. We must now ask what precisely it amounts to. Are not point-instants as separate and self-complete as instants themselves? What does their combination add? So long as we took motion as something more than a mere combination of points and instants, a concrete unity for which they furnished the relational structure, we seemed to have an answer. Now that interpretation has failed us, we must look elsewhere. Alexander has three suggestions, and we will consider them in order.

(a) The separateness of point-instants is said to be "ideal". "Point-instants are real but their separateness from one another is conceptual. They are in fact the elements of motion and in their reality are inseparable from the universe of motion; they are elements in a continuum. They must not be regarded as physical elements like the electrons, but as metaphysical elements, as being elementary constituents of Space-Time or Motion. Real they are, but if the apparent paradox be pardoned, they are ideal realities."27 Now this is obviously futile. If there were room on Alexander's theory for the distinction between ideal and material, if to be ideally separate were different from being existentially separate, then the pointinstants might be separate as positions, as relational elements, without thereby compromising the continuity of the concrete motion. But these ideal realities are really the stuff and material of the motions in question and the dis-

<sup>&</sup>lt;sup>27</sup>S. T. D., I, p. 325.

tinction introduced by Alexander contradicts itself, as the following quotation indicates. "It (the point-instant) is an ideal, not an actual movement, and just for that reason it is the actual elementary existent and is real just in virtue of its ideal character." And, in reply to Broad's cricicism Alexander adds that "conceptual" means merely "reached by concepts" and hence, on this realistic theory, has nothing to do with the actual status of the point-instant. If they are ideally separate, point-instants are really separate, and their conceptual isolation can only register an antecedent real isolation. The problem is hardly solved by this device.

(b) A second line of argument is more important. There must be some element of transition within the pointinstant if it is of the stuff of reality, and our author attempts to put it there by the marriage of point and instant. "The point is never at rest but only a transition in a motion. Now it is this restlessness of the point which is expressed in terms of space itself by the criteria of continuity which the mathematician adopts in order to free his points from their apparent isolation and self-dependence." And hence, "A point-instant is by its very nature a movement. not something statical. It is an ideal, not an actual movement", etc. Hence we need not go beyond the point-instant itself to reach our goal. It is the "limiting" form of a movement, to be sure, a movement at its limit, as Alexander often says, but here the limit and the concrete motion are of the same stuff, and the limit is itself an "ideal" movement.

Mr. Broad has suggested the final criticism of this solution. A point-instant as a limit lies not on one line of advance but on many which intersect in it. Now these mo-

<sup>&</sup>lt;sup>28</sup>S. T. D., I, p. 272. <sup>29</sup>Mind, N. S. 30, p. 415. <sup>30</sup>S. T. D., I, p. 148. <sup>31</sup>Mind, N. S., 30, p. 32.

tions differ *inter se* in their directions and yet this point-instant is common to them all. If it is veritably "only a transition in a motion" it must be several distinct transitions in quite different motions and its inherent restlessness will amount to nothing less than ague. Again, even an ideal motion must have at least an ideal velocity, and a limit or intersection will not possess it. It is the same story once more. You simply cannot telescope form and matter in this fashion. As a position, as a limit if you will, the point-instant is common to many motions; turn it into a concrete motion on its own account and you are combining contradictory characters. Your position is not a motion, and your motion, even as ideal, could not fill the functions of a position.

(c) The final answer is extremely significant. In his reply to Broad, Alexander faces the difficulty quite frankly. "How then, it is asked, can there be several motions intersecting at an event-particle (Broad's substitute term for point-instant) as the perspective notion demands? Is not that to imagine an event-particle which is the limit of a motion having several velocities at once? But is not Mr. Broad in finding this difficulty taking an event-particle to be not a limit but an infinitesmal, a very small duration. Velocity can only arise out of the transition between one event-particle and another—I must not say the next. That being so, there is no more reason why motions should not intersect in the same event-particle than why lines of different direction should not intersect in a point."32 transition that was to have saved the event-particle has now gone clean out of it, for, once more, even an ideal motion would need an ideal duration. The transition is now "between" event-particles, and only there can the characteristic properties of motion such as velocity appear. And this is quite ruinous. The very essence of Alexander's theory

<sup>&</sup>lt;sup>32</sup>Ibid., p. 419.

is that the relation between spatio-temporal elements is of precisely the same character or stuff as the terms themselves. "Any relation between moments of Time is then a piece of Time itself, and duration is not a relation of the timeless but of the timeful, and while duration is made up of the instants it connects, these instants are connected by duration. For the relation and the terms are of the same stuff."<sup>38</sup>

This should settle the matter. The velocity that only appears in the transition from one point-instant to another does not appear at all, for that transition is itself a pointinstant or set of them. So long as we distinguished pointinstants from duration, so long as relations were of a distinct and autonomous nature that escape was possible. But now the terms and the relations are a single stuff and the terms are limits that are not even very small durations. This last appeal is very instructive in relation to the whole argument, summing up as it does the central and final defect of the absolutist scheme. In his chapter on "Relations in Space and Time" Alexander rules out the relational theory as ultimately valid because in Space, and also presumably in Space-Time, relations are homogeneous with their terms, and those terms are of spatio-temporal stuff. The attempt to define relation autonomously fails because, according to our author, you must use the term "between", which is itself a relation. Thus relation does not justify itself but must be grounded in Space-Time as stuff, in whose "crude continuity" the notion of betweenness has its basis and justification. Relations depend upon the absolute Space-Time, not the reverse. That the attempt to vindicate this crude continuity should here force Alexander to appeal to this very relation of betweenness to introduce the requisite continuity not discoverable in the terms is at least poetic justic.

<sup>&</sup>lt;sup>88</sup>S. T. D., I, p. 260.

To sum up. Of the three phases of relativity initially noticed, not one remains. The fusion of form and matter, of structure and stuff, into a contradictory absolute has been our theme throughout. Only by superposing their differences and asserting simply those characters which really hold only in specified and distinct relations was the synthesis possible at all. And we have seen its consequences. Again, the system of perspectives has turned out to imply only an odd set of adventures for pure Time, its purity all uncompromised by the irregularity of its spatial relations, in absolute Space. Points and instants do not arise from the relations of perspectives, rather perspectives are the by-products of the liaison of points and instants. The full extent of this subordination of perspectives will be the central topic when we reach the theory of knowledge. Finally the complete interconnection of events has disappeared. For the ultimate "pure events" are point-instants and we have found no legitimate and allowable connection in or between them. One cannot subordinate relations and still have an ultimate relatedness.

In conclusion it must be repeated that these difficulties are not insisted upon for their own sake. It is the very adequacy of Alexander's account that lays it open to criticism. A less honest thinker would have suppressed the actual diversity of things; here it is frankly faced. The ultimate "self-diremption" of the hypothesis is a condemnation of its narrow structure, but it is no less a tribute to the initial insight, whose genuine fruitfulness, as its consequences so plainly indicate, is not to be confined within the limits of an absolute metaphysic.

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## IS POLITICS A BRANCH OF ETHICS?

I T is an opinion which can usually be stated without fear of challenge from philosophers, whether idealist or pragmatist, that Politics and Ethics are two aspects of the same subject. "I hold to the simple view", remarks Professor Laski, "that Politics is a branch of Ethics." John Dewey, in protest against "abstractions" has insisted as much as did Bosanquet,<sup>2</sup> that the two studies cannot be conducted apart. Thirty years ago Sidgwick said that the study of Politics is concerned with the system of relations which ought to be established among the persons govern-

Professor Dewey, on the one hand, denounces a theory, e. g. of economics which involves an abstract consideration and hence (he thinks) falsification of human conduct, and, again, (Human Nature and Conduct, 1922, p. 320) attacks the doctrine of a "sharp line is tween moral conduct and a larger region of non-moral conduct which is a matter of expediency, shrewdness, success or manners". Of course, he does this not in the name of any absolute ethic, dominating the field of expedient means to the stultification of any study of technique, but in the name of a single technical 'science of human nature'. We need not here follow him into this doctrine or inquire what would be the nature of this science of conduct in a "big, booming, buzzing world" of affairs, or what would be its relation to the discussion of the consistency of values. We are merely concerned to emphasize the point which Professor Dewey himself makes elsewhere to the effect that the development of the sciences dates from the time when "science ceased to be identified with appreciative contemplation of noble and ideal objects" (Experience and Nature, 1926, p. 150; also Human Nature and Conduct, p. 277) or even, let us add, with the problem of right conduct. When Professor Dewey would make war on a certain treatment of the problem of the rightness of conduct, the business of the student of politics is, in the words of the Psalnust, to "keep his soul as a weaned babe" and "naind not high matters".

<sup>2</sup>B. Bosanquet. *Philosophical Theory of the State*, 1926, p. 47. It will, however, be noted that Dr. Bosanquet in carefully guarded language distinguishes the philosophical from the natural science approach, which he regards as complementary. The emphasis is upon the study of politics from the side of ethics, the hope is that "sociological psychology will not remain wholly 'positive' and 'impartial'," but the distinction is admitted as actual if not approved cordially as legitimate.

ing and between them and the governed.3 This phrase itself serves to illustrate an ambiguity, which runs through all discussions of this topic. Sidgwick, in a later passage, quotes with approval a remark of Bain to the effect that politics deals with the structure and functions of government as they must be. And most moral philosophers are prepared to admit that the Aristotelian method, in so far as it studies what does happen and what 'naturally will happen', is more appropriate to Politics than that Platonic construction of Utopias, which is guided only by the logic of the argument and not by the practicability of the conclusion. There still, however, remains the doubt whether. in discussing the best practicable constitution, we are to be satisfied merely with intrinsic evidence of practicability or are to introduce an extrinsic pattern of what ought to be, to which what is will partially approximate.

The issue lies in whether politics is under an obligation to discuss the nature of the perfect or normative forms of social organization, with their implied moral imperative and 'ought'; or whether its concern is only with actual forms, or with average forms, or with simplified forms illustrating the principle and methods of political action, what habitually does and perchance must happen, or, lastly, even with developed forms, in the sense, however, merely of those which are most explicit and, hence, easiest of understanding. If Aristotle meant more, by his advice to study things in their more perfect and less embryonic forms, than that the more developed form will (we must add, sometimes) show most distinctly the characteristics of the institution, was not this advice a lapse upon the part of the great naturalist, which has condoned, by his authority, loose thinking to this day? Is politics concerned with the methods and more fundamental processes of all political

<sup>&</sup>lt;sup>3</sup>H. Sidgwick, The Elements of Politics, 1897, p. 15.

<sup>4</sup>Ibid., p. 15.

organization, sometimes susceptible of generalization, perhaps even yielding deductive statements following from the necessities of organization; or is it concerned with "the best of all forms of political association for persons whose life is capable of approximating most nearly to an ideal?" The latter has remained the orthodox position, and it is not likely to be disturbed either by an historical school which yields no principles or by the pretentious claims and inferior philosophy of the schools of Comte and of Spencer.

Is the orthodox doctrine right? In the writer's opinion it is emphatically wrong. It is wrong, not because it is not in a measure true, but because it is not the entire truth and misleads us in our search for fruitful methods of interpretation. This is not, of course, to say that we cannot introduce a distinction of practice between the contents of political and of ethical action, or between moral and nonmoral acts. Nor is it to introduce the misleading distinction between means and ends, as though these were as capable of concrete disconnection as railway lines from the railway termini. But it is affirmed that we may give an account of a subject, such as politics or economics, from as different points of view as are those of the physicist and the musician in their accounts of sound. It is further affirmed that. as a matter of method, it is no less expedient to do this in politics than in economics and that, in so far as men are not only choosing but also organized beings, it is pro tanto as necessary to study process apart from valuation in the social sciences as in the physical sciences. And the most cursory inspection of the literature of political theory will show that this has not hitherto been done.

The alternative method of interpretation, which is here preferred, is not what Professor Moritz Bonn has stigmatized as "a cheap pragmatism", resulting in the production of nothing better than manuals for diplomats,

<sup>&</sup>lt;sup>6</sup>Aristotle, Politics, II.

guides for civil servants and textbooks for students of public utility bodies. We may agree with such writers as Professor W. Y. Elliott who are convinced that "facts cannot be separated from ideas with any more fruitful results than attend the abstraction of ideas from facts". Politics does not come much nearer to attaining the dignity of being an autonomous subject in America where it risks being submerged in the accidental details of Government, than in England where it is treated as a branch of Ethics or History, or in France where it is an appendix to the study of Law. The proper basing of the subject will probably require the costly assemblage of a mass of relevant data hitherto uncollected or buried in unread governmental publications and 'blue books', but the treatment of the material will require the deductive as well as the inductive method.

The objection to the approach to the study of political phenomena by the road of Ethics is not that we are thereby led to concern ourselves with "ideas" and "abstractions", but that all our study of social conduct becomes perfused with estimates of value. The result is that, when we are saved from the dogmata of legal metaphysics, we are treated to rival philosophies of the state and of society which appeal, on analysis, to our judgment of the relative value of various human ideals, such as social devotion and personal initiative. And, although we may prefer the new social scheme to the old, as apparently more humane and just, we are aware that we are not materially advanced towards that understanding of social conditions which will enable us to decide what plans are feasible and to affirm with confidence what social reforms are so far impracticable as to militate, in effect, against human happiness. And, until we know this, our utopias remain matters of idle dialectic or of aesthetic taste, and the realization of our ideals a matter of 'horse-sense'. To

substitute for this an intelligent comprehension and rational exposition of the methods men use in their social relations and organization is the task of the *political scientist*.

The task, on the other hand, of the student of ethics is to study the value and consistency of ideas of the good, and, in political affairs, to project his judgments on the social plane. As political philosopher, he is concerned not only with what men do but, also, with what, equally concretely, they ought to do. But precisely in this projection of consistent values upon the plane of social conduct lies the difficulty and the issue, as Kant saw long ago when he drew his sharp and entirely legitimate distinction between the world of free will and the determined world of phenomena in which the self-determining individual must endeavour to make his decision effective in action. In the social relationship, from which logically issues a series of limitations on action, it is necessary to discuss not only what it would be good that a man should do, but what in particular he can do to realize that good. When it comes to the question of means, the individual becomes immeshed in a logic of the social situation which is independent of his personal ideals, although not in some minute degree uninfluenced by them. This situation is a construction of the wills of men past and present, compounded with more alien and material factors. To these rules of what it is possible to do, which issue from the very fact of relationship, we must adapt our notions of an orderly society and of the means of improving it.

These political rules are not to be arrived at solely by a priori speculation on the principle of consistency. The "concrete morality" of the Hegelian, in so far as it teaches something which ought to be done and not a mere adoration of the intrinsically determined process, is as vain as the allegedly "subjective morality" of the disciples of Kant, until we understand the rules which govern the realization

in the concrete of any morality. Nor is it profitable to follow Hegel in considering these rules, dictated as much by the non-moral as by the moral elements in the social situations, as themselves identical with principles of ethics, metaphysically considered, springing logically from the eternal foundations of being. Rather it must be confessed that, historically, our notions of what ought to have been moulded by our experience of what has in fact conduced to social harmony. We do not, however, wish here to affirm a pragmatic theory of ethics apart from logical considerations of coherence and consistency. We merely wish to state that, whatever may be our views and scheme of the good, its realization depends upon an objective situation of which the system and rules may profitably be studied in their own right. This bondage of what ought to be (in the future tense) to what can be has long been patent in the field of economics; it is time that it should be recognized in that of politics. This contention is not, of course, designed to affirm that any given economic or political institution cannot be changed, and another more conformable to ethical ideals put in its place; but it is to say that, whatever may be our economic or political ideal, it will have to be realized by certain methods and cannot be realized by other methods.

Hence, there is a choice. Either, on the one hand, we may present for consideration a scheme of public welfare and a political ideal, as deserving of approval because its premises accord with certain common "moral intuitions"—if this phrase may be permitted, since it is difficult to find any other words save "aesthetic judgments" by which to denominate, e. g., some men's apprehension of the duty of self-expression in conformity with an as yet unrealized social harmony, and other men's sense of the right that the actual interest of the majority has to be preferred to that of the minority. Or, on the other hand, disregarding the

varying ideals of men, often fundamentally at variance owing to the lack of sufficient experience to permit of a discriminating judgment, attention may be called to certain facts and sequences which we must admit to exist or be customary, whatever interpretation we may choose to put

upon them.

That a man of property has certain means for selfexpression which a poor man lacks is a fact, whether we do or do not hold that a man should be able "to exercise a continuous initiative above the things which make life significant", do or do not hold these means important to "living with dignity and self-respect", and do or do not hold "magnisicence" to be a virtue. The social consequences of unfettered testamentary rights are matters which can be studied independently of whether we believe in the equalization of property or in the encouragement of the psychological motives for effort and thrift. The consequences of war are not the less its consequences because they may happen to be very repugnant to the ideals which we entertain on the subjects of national development, sovereignty, patriotism, courage and the like. Whether our ideal happens to be a present social harmony or it is our conviction that "war is the father of all things", and that nothing must impede the ablest from inheriting the earth, the study of social sequences will indicate to us, at once the difficulties which confront, and the facilities which offer themselves for, the realization of our ideal. The study of social method may be a less noble pursuit than the evaluation of social ideals, but it holds forth better prospects of substantial agreement.

In brief, it is possible to distinguish between an exposition, on the one hand, of the most reasonable and benevolent ideals for men to possess as a guide to political action and, on the other hand, an exposition of those sequences of social events which we detect as probable if

this or that course of procedure be adopted. And the danger alike of the Pluralist School of Gierke, Duguit, Cole, Laski and Krabbe, and of the Unitary School of Jellinek, Bosanquet, Esmein, Willoughby, and Elliott is that they display a comparative disregard of the method of approach through the painful study of fundamental social structure, through the probing of social organization as declared by such data as emigration, employment, poorlaw, health, marriage and population statistics and reports, through the detection (with all the joy of a chemical discovery) of habits in human social method. In lieu of this, they offer to our aesthetic sense of what is orderly, just, beautiful and good, rival appeals, liberal and conservative. alluring, but unsubstantiated by anything more conclusive than illustrative detail. Still we remain in the realm of independent judgments, too often swayed by unconscious prejudice, not in that of conclusions as nearly assured as man may reach to objective grounds for assurance.

II. "A man", says Spinoza, "whether wise or ignorant, is a part of nature . . . . and does nothing, either from reason or desire, except according to the laws and rules of nature." It may, however, be objected that the structure of human society cannot be examined as we would examine that of a sea-urchin. We cannot for a moment ignore, in the study of politics, ethical considerations. We shall ascend to certainty, above the petty conflicts of the hour, thanks to our convictions as philosophic students of the

<sup>6</sup>The above distinguished jurists and political scientists are, of course, no 'arm-chair theorists'—a fact emphasized by Professor Graham Wallas in reviewing Professor Laski's *Grammar of Politics*. But although Mr. Laski commends (in his inaugural Lecture *On the Study of Politics*, 1926) such institutional studies as Profesor Wallace Notestein's admirably grounded work on the House of Commons in the seventeenth century, the broad emphasis of their schools tend to be on the humanistic study of ethical, legal or political theory, rather than upon the precise knowledge of past and present history so far as it tends upon analysis to yield a better understanding of the nature of actual social organization. But, for indications of the other line of thought, vide, e. g. *Grammar of Politics*, p. 243, and Professor Laski's frequent insistence upon the need for an inductive study of politics.

ideals of the past and as men of broad ethical experience, not by grovelling in statistics or by deluding ourselves with vain hopes about the methods of economics or of political structure. These 'principles' and 'systems' tend, as Mr. Tawney and Mr. Hobson have in different ways shown,' to be the sport of the interests of an age or civilization,—its bad dreams in which it seeks to excuse itself to men for its conduct, ad excusandas excusationes in peccatis. These economic and political institutions themselves, it may be alleged, are not the partial expression of permanent human 'methods', but historical incidents and moments in the development of the ideal destiny of man. Instead of these passing conceits of a posteriori reasoning, we are asked to turn our eyes to ethical certainties or to the evolution of ethical ideals in history.

It is true that the study of human social structure is not comparable to the study of the structure of echinus esculentus. Men are living, conscious and purposive beings,8 and the structure which they build up is not only adapted but purposive. The structure of the sea-urchin has been formed by (or, rather, has taken form under the action of) Nature, to perform its function. Social organization (perhaps more erratic in its functioning) more clearly indicates the purposiveness and wilfulness—although not always the conscious purposefulness—of the constituent members. Human beings, it must be admitted, are swayed, if by material stimuli, yet, at least in part, by imagined satisfactions and by ideal motives which do not trouble the nervous system of the shell-fish. The task of politics is to study, as its subject matter, masses of individuals wrought into social organizations-masses through and through

<sup>&</sup>lt;sup>7</sup>R. H. Tawney, Religion and the Rise of Capitalism, (1926) and J. A. Hobson, Free Thought in the Social Sciences, (1926).

<sup>&</sup>lt;sup>8</sup>Whether purposes present to the imagination are properly to be considered final causes in a teleological sense or are capable of being adequately described as *stimuli a tergo*, I am not here concerned to discuss.

moved by value-judgments. The subject matter of Politics is, then, a society of ethical beings. Hence, it may be argued, Politics must consider the ethical nature of man.

This argument is entirely sound so far as it goes. But the student of Politics is concerned with the moral opinions of men just in the same fashion as he is concerned with their other opinions, and as Machiavelli or Montesquieu were concerned with their religion, viz., in so far as these are factors actually influencing men's conduct. Ideas and ideals are realities as much as cannon and bayonet, plough and merchant ship, and like these merit political consideration when in action. Morals must be taken into account by statesman and by political student as facts to be reckoned with. But the student of politics, speaking professionally, is quite unconcerned with the inherent value of men's ethical beliefs. Like an art master, his task is to teach how the most skilful use may be made of these or those materials, not to dictate what design shall be executed in them. He is less concerned with an ethical opinion of indubitable propriety, weakly held, than with a moral superstition or with a prejudice obstinately held. Reasonable opinions are indeed eternal, but they are not always the most influential, nor is the significance of good opinions independent, as is pure logic, of the time and place. The student of politics is concerned with men, and men happen to be value-making beings, but he is not concerned with the soundness of their values. That he may also, in another capacity, be the best ethical philosopher on the subject is another issue, irrelevant to our present argument. enough to remark that, if he is also to be ethical philosopher, passing value judgments, caution, interest and selfdeception may make him lose that bold, experimental and hypothetical attitude which is essential to the scientist. The student of politics may consistently be regarded as a detached observer of man's behaviour, and as concerned

with moral principles not for their own sake but as stimulating action. The thinker who insists upon regarding the problem of politics as the ordering of mutually exclusive and self-centered individuals in such a fashion that out of private vices accrue public benefits, is caricaturing the facts to suit a theory. But it is no less a distortion to assume that the forms taken by political institutions are in fact only determined by the nature of man at its most rational and moral elevation. The task of the student of the body politic is to study the physiology of social structure as he finds it, and not as he conjectures that it should be in accordance with the principles of some philosophic Galen or Hippocrates.

III. The task, however, of a statesman, it may be objected, is not to fit human beings together like pieces of wood in a jig-saw puzzle, so that each, despite his personal preferences, ideals and prejudices, accomodates himself under law to each. The political life involves action and movement. The statesman has to deal not with wooden blocks, but with human beings with purposes and policies. He must decide on such policies himself. The whole political arena is one of action, and of choice between alternative plans. And the student of politics, in studying this arena, must study these rival policies and adjudicate between them, as contributing to human welfare and social harmony. Hence his task must again be affirmed to be essentially an ethical task.

It must, of course, be admitted that the work of the practical statesman is in large measure purposive on a broad scale, and not merely one of opportunistic accomodation to momentary pressure. It may well be, moreover, that it is the loftiness or baseness of these purposes which peculiarly stand in need of criticism by ethical philosophers. But the political scientist should not be concerned with what may be the final purposes of the statesman, but with

what courses of action it is feasible to pursue and, among alternative courses of possible action, with what will be the consequences of each. He is not called upon to choose for the statesman which set of consequences he or his country may prefer, whether those of Fascism or those of Bolshevism, but to verify with as much care, and to demonstrate with as much impartiality, as is within his power, that these or these will be the consequences, if such or such a course is adopted. Of several theoretical courses of action the ethical philosopher can point out that some are desirable and others undesirable. Of several courses of action the political scientist, as a student of the social facts, should endeavor to fit himself to be competent to indicate that some are practicable, others impracticable. It will be incumbent on the statesman, if he wishes his work to be beneficial, to choose with the ethical philosopher, the desirable course and, if he wishes his work to succeed, with the political scientist, the efficient course to attain the proposed end. He will not repeat, for example, the error of many of the early legislators in the field of Poor Relief. Many, again, of those who agitated, in the name of good morals, for the suppression of the publication of divorce news in the English press must have been surprised (and yet the result was obvious enough) by the subsequent increase in the number of divorces. What indeed is efficient must in many instances be a matter of doubt, but what is not feasible will, if the field of interrelated social facts is systematically explored, probably not be so dubious. Men, during the course of history, have been using repeatedly certain methods of overcoming social difficulties, of which the adoption seems to issue almost inevitably from the circumstances of the recurrent situations. As Machiavelli wisely observed, each individual does not hew a fresh path to success through social problems or find a new modus vivendi for himself. On the contrary, certain typical methods of

coping with political difficulties, which tend to recur in only slightly different forms, are repeatedly adopted. It is the business of the political scientist to detect these habitual 'folkways', to examine their institutional 'methods', tried by the experience of the race, and to study at once the limits of their applicability and the variations which can be made upon them without the probability of disaster. The study of these methods is, of itself, an adequate problem for political science.

Were we all agreed (which is not conspicuously the case) upon our architect's plan of the just society, it would still be necessary that we should know a little practical engineering, and not leave everything to the 'horse sense' of our political foremen and bricklayers. We may say to some philosophers what Cromwell said to the Presbyterian divines: "I beseech you, in the bowels of Christ, think it possible that you may be mistaken". It is at least possible that, to the end of time, intelligent men will differ, according to their psychological constitutions, upon the precise shape which the just society should take, and that in the mundane world of political construction we shall be confronted by ethical pluralism as a persistent difficulty. What, to an artisan, may be Utopia, to a Henry James may be a place to leave post-haste at the end of a fortnight. Or we may explain querulously with Kant, that, without this diversity and "individualistic assertion," "an Arcadian life would arise of perfect harmony and mutual love as must suffocate and stifle all talents in their very germs". Professor Laski has repeatedly affirmed that the statesman must guide his policy by consideration for the actual plurality of men's ideals. Even Professor Hobhouse, although pursuing one 'rational good', admits that what we choose to denominate 'moral impulses',—the very points of reference of our rational moral system—"must be there before we can appeal

<sup>\*</sup>Kant, Idea of a Universal History, Sect. IV.

to them'; that "the principle which I accept as binding must be one that appeals to me as a decisive ground of action"; that, in the actual world of affairs, one man's good is not another's; and that the realization of the system which reduces to terms of social harmony these diverse goods will, at any given time, only be comprehended approximately and, hence, in varying fashions.<sup>10</sup> Short of omniscience, there remain many possible perspectives of the world, cross-sections of experience, which will on different planes and at different angles, prove consistent with commonly acknowledged moral premises and "principles of rational living". For example, Professor Hobhouse would admit that the scholastic Catholic world-view is not the only one, and yet it would not be unreasonable to admit it to be self-consistent. Ethics is not a problem in plane geometry.

We may indeed place the ideal and the good in society itself, as an organization, after the fashion that Mr. Bertrand Russell terms 'mechanical'," little recking whether the individual does or does not voluntarily cooperate. But we still remain faced with the perpetual facts—even although we choose dogmatically to deny the morality—of resistance and of dissent.

Whatever, then, may be the Utopia or scheme of social good which we plan in rivalry with our neighbour's scheme, if it is to exist elsewhere than in the *Jenseits*, it will have to conform to certain observed rules of social organization. We cannot indeed found upon the imperative character of these rules any ethical doctrine of obedience, as M. Duguit endeavors to do, but the rules hold nevertheless for all effective political acts. The principles are not themselves ethical, but their recognition is prerequisite to the realization of what is ethical. It may be that all our energies, in this generation, should be concentrated on the triple pro-

<sup>&</sup>lt;sup>10</sup>L. T. Hobhouse, The Rational Good, 1921, pp. 106, 112, 121, 182.

<sup>&</sup>lt;sup>11</sup>Bertrand Russell, Prospects of Industrial Civilization, 1923, p. 266.

gramme of securing the subordination of war to international arbitration; of removing from women disabilities due to status impeding a valuation by individual merit and competence; and of providing for the worker the possibility of obtaining the wherewithal for a life of self-respect and security from the carking fear of destitution. But our work will have been done in vain if our reforms are such as to fly in the face of what it is feasible to do without producing social dislocation and chaos. Behind the ideals and the value judgment must lie that wise intelligence upon which Plato, the poet and prophet of political science, insisted; and a knowledge of the social facts in which Plato was so conspicuously outdistanced by his great pupil, Aristotle. Behind our plea for the study of facts, of structure and of method lies the whole moral claim for realization of our ideals for civilization. Imperatively they command us to study. But these ideals are not the facts, structure or method,—nor yet the understanding thereof. "Nature is conquered only by obliging her." "God forbid", elsewhere exclaims Francis Bacon, "that we should give out a dream of the imagination for a pattern of the world". By the "general principles which govern success in social organization",12 we mean those which are observed to govern it, not those which ought to do so a priori. Ideals may then differ beyond hope of reconciliation, without the study of particular methods being infected by a like multiplicity of standards. And the problem of the politicist is a problem of method.

IV. It may, again, be urged that, even if the object of political science is to study human methods of social accomodation, it yet cannot rid itself of the responsibility of pointing out which of these methods are in the long run more theoretically sound than others. After having studied the structure, it will develop its theory of social me
12G. D. H. Cole, Social Theory, 1923, pp. 202-3.

chanics or of political physiology, and must make some practical suggestions about social engineering or therapeutics. And its norm of sound structure or of health will, apparently, be that of the maximum social accommodation or of harmony, with the minimum of friction and of coercive readjustment—"a minimal adjustment" to use Mr. Laski's words. In brief, we are back at the ethical discussion of social justice and of the harmonious state. And should we dispute this technical ideal, e. g. of harmony, we shall find ourselves committed, with Aristotle, to an inquiry into what may be the desirable life which the technical organization of society has for its object.<sup>13</sup>

It may be true that the ideal society, from a technical point of view, would be one of perfect harmony and of parallelism of wills,—although the contemplation of this technical perfection, which is like that of perfect equilibrium, must not be allowed to provide us with an excuse for ignoring either the permanent thrust of individual will against individual will, or the outbreak, each time society is conventionally stabilized, of new problems arising from the development of personality. It may, moreover, be, were we to regard as absurd Nietzche's system of values, that the perfect harmony of developing personalities 'into a complete and consistent' (social) 'whole' is the ideal of society and the political form of final value. The theoretical model, the diagrammatic sketch, as it were, of society for the political scientist would, then, be identical with the scheme of society towards which are pointing those ethical philosophers who accept this belief in the goal of social harmony. The 'normative' scientific society and the ethical society, the 'wise' and the 'virtuous' society, would (as Plato, the first political scientist, taught) be the same. We may even say more strongly that they must be the same.

It does not, however, follow that the method of <sup>13</sup>Aristotle, *Politics*, IV.

approach to the study of the material should be the same, or that scientific politics is a branch of the poetical and value-judging work of the ethical philosopher. It may, for example, be that some particular social order has come to stand for injustice and ethically requires radical reconstruction. On moral grounds we might demand a rootand-branch departure from the old precedents. Institutions, after all, are like clothes, which should be suited, not only to fashion and propriety, but also to the climate and the body's health. We may challenge the 'what' of Montesquieu with the 'why' of Jean Jacques Rousseau. And, again, we might criticize on the ground that taken as a whole the system is not efficient in furthering human happiness. It may be like an obsolete machine; the parts may be cleverly made and effective in operation, but the machine in its entirety is no longer competent to meet requirements. Nevertheless, even here we must distinguish between our judgment upon the technical excellence which satisfies those in an industry and aesthetic or moral qualities which an outsider may detect in its products or their use.

From the political point of view the test of a social system is whether, in the short run or the long run, it in fact arouses discontent. Not that it must be rashly concluded that blessed is the country of which the inhabitants are ignorant and swinish, for ignorance is the mother not of content and progress but of servility and servile revolts. Discontent, however, in Russia for example, is not a problem for the political scientist until it exists or, in the light of past experience of human nature as distinct from the rarer human aspirations, is likely to exist. Home Rule for Ireland or Ulster may in fact allay discontent, although careful political theorists, such as the Cecils, may maintain that such an adjustment should not be tried as being based on a false theory of the state and on a false ideal of

nationalism. Cogent examples could be picked from the field of criminology. A divorce law, again, which permits divorce only on the ground of adultery may be an impeccable moral gesture, but it will still have to be asked whether it is actually efficient in conducing to morality or is in fact provocative of adultery as a means of divorce, and of similar symptoms of social unrest. From the ethical point of view, however, the test of a social system is whether men ought to be educated to obey or to repudiate it—whether, that is, it gives justifiable ground for contentment. So long as we live in time and in history, technical perfection falls short of ethical perfection by just the difference by which satisfaction with the good and competent falls short of longing for the beautiful and best. And the difference is the province not of political technique, which gives fulfilment to men's wills, but of education of mind and sentiments, which enlarges men's needs and enriches what they desire to will.

Issuing from the inherent necessities of social organization those rules of political method may perhaps be discovered which govern the embryology of institutions and condition all changes, organic as well as functional, which are not to be condemned by their consequences in lethal violence. The detection of the principles, which are much more profound than mere technical devices and are rather comparable to physiological laws, which condition social health and disease, must follow a naturalistic method. The harmonious energy of the social order resulting from healthy reconstruction will singularly exemplify whether we have rightly understood these principles of social physiology and morphology. But our judgment of what is the most beautiful human form will not be merely a summary of our scientific knowledge of physiology. Similarly, our judgment of the best civilization will not be merely a description of a well ordered and highly contented civil society. The ethical ideal and the technical ideal are parallel, but not identical.

V. Civilization hastens forward on its own momentum. and suffers from disasters which appear to arise, not from contemporary human wills, single or collective, but from 'circumstances'—circumstances in part the fruit of past ignorance of the rules of social organization. And educational ideals are no substitute for that exact inquiry into present facts which often express the satisfactory, as distinct from the a priori, ideal of social accomodation. Amateur fumbling and criminal negligence in the task of the expert government of society and in the enactment of scientific and appropriate legislation continues to be responsible for much of the trouble. But experience too often makes fools of the wisest philosophers for us to allow that ideals, culled from past experience and educationally inculcated, are alone sufficient instruments, without patient study of the present situation, with which to meet contemporary difficulties. If, like doctrinaires, we persist, our ideals become gaunt ghosts, which as often curse as bless the birth of new forms of social life.

To assure the statesman that, at his best, he has only to concern himself with ethical judgments, of which political policies and programmes are a part—and which may perchance be learned thence—is to permit him to underestimate his obligations. He has not only to be convinced of the honourable and beneficent nature of his intentions, he has to be impressed with his obligation to be intelligent in administration.<sup>14</sup> And intelligent and scientific administration involves a far greater knowledge of social facts, apart

<sup>14</sup>Vide the Master of Balliol's article on "The State in Recent Political Theory", Political Quarterly, February, 1914, pp. 144-145. "In the meantime let us realize the government has before it a task of extraordinary complexity and supreme importance, and that for that task... are necessary... above all, knowledge on the part of all who govern or help to govern of all the bewildering details of the situation with which we are confronted and of the effects of interference with that situation."

from our moral interpretation of them, than has ever yet been attempted. It is better to be an intelligent man with out strong ethical prepossessions, under whose intelligent and tolerant administration others may develop their own ideals, than to be a fumbling fool—some Pietro Soderini even although one's abstract ethical ideals are impeccable. But no plea is intended here that political science is, in some strange way, 'superior' to politial philosophy, or that what matters is technique and not idealism—form, not life. It is best to be a wise man who recognizes that the discovery of a faultless ideal involves complete wisdom, and who yet moves on to the best ideal that he can see, with respect for the ideals of others and with recognition that the Kingdom of God is within men, not to be organized against their wills. It is best that the statesman should combine this ideal with an intelligent comprehension of how the social organization, as a practical system, may be enabled to run smooth and fast, despite the different satisfactions which men seek from its products—an intelligent comprehension of how the whole society may wheel and swoop together, like a flock of birds, although not all may be birds of one feather or of one song. And it is best for political science, holding itself detached from value judgments, to cultivate that wisdom which lies in a precise knowledge of the facts of organization and in an intelligent appreciation of their relationship. To teach that the conduct of affairs is a matter of moral intention only and not of scientific investigation-a matter which constitutes a distinct province of inquiry from that into ethical values—is to encourage some of the worst delusions which tend to be associated with popular government.

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# THE PSYCHOLOGICAL BASIS OF AUTOSUGGESTION

I

THE scientific basis of autosuggestion has not been sufficiently explored. sufficiently explored. Owing to the great success of its founder, the late Emile Coué, and owing also to the efficient propaganda of Coué's disciples, its therapeutic value has come to be increasingly recognized. Many at the present day know what autosuggestion is; a few even practise it; but those who, to any extent, are conscious of its foundations, are indeed fewer. Even experts seem to have devoted more time to the practical side of the matter than to theoretical considerations. Perhaps this pragmatic note is responsible for the fact that even Baudouin's epoch-making work has missed that accuracy of definition and that examination of basic principles which are essential in a scientific treatment of the subject. If autosuggestion is to gain a scientific status; if it is to become anything better than a passing fashion; if, that is to say, it is to have a permanent place among human disciplines, it is necessary to inquire into its psychological foundations and to bring out explicitly the principles underlying this wonderful phenomenon.

Even in the interest of practice there is need for such an inquiry. Failure is not uncommon in the course of therapeutic suggestion, especially when the suggestion is an induced one. At times one comes across failure of a peculiar

kind; all the conditions which are ordinarily considered to be necessary for success are present; nevertheless the result is negative. The situation is so perplexing and the difficulty so inscrutable, that the case is given up as hopeless. When confronted with a situation of this kind it occurred to the writer that the failure might be due to the assumption, hitherto undetected and unquestioned, that there is no difference between one mind and another, and that, consequently, a suggestion naturally suitable to one is suitable also to the other. Efforts were therefore made to apply the distinction of mental types to the case in hand, and investigation was directed to the discovery of the type to which the mind in question belonged. When this was done, it was possible to give proper suggestions; and the result was a pleasing surprise. Failure in practice is after all due to a defect in theory, and the best way to overcome the former is to re-examine, and, if necessary, to re-state the theory on which practice is based.

The most practical method of approaching the end in view is to raise a question at every stage in the description of the phenomenon. Coué defines autosuggestion as the planting of an idea in the self by the self; and Coué himself and all other advocates of the method constantly refer to suggestion in terms of images. Is an idea the same as an image? If not, should not the distinction have bearing on the process? The difficulty is not over even if we consider the terms as synonymous. There are differences in ideas or images; in form they may be creative or representative, and in content they may belong to one of the types recognized in the psychology of imagery. To choose the proper idea or image is not enough; in order to be successful the suggested content should be positive in character. A negative suggestion, we are told, defeats its own end. What is there in the character of a negative that it fails of its purpose, while a positive invariably succeeds? This

problem has no doubt been examined by writers on autosuggestion, but the inquiry has not been penetrating enough. Even a positive suggestion will not succeed unless the mind has faith in the suggestion. What is faith? What psychical modification is brought about by it, and what is the law which governs its operation? Lastly, we are told that autosuggestion should be carried on in seclusion: we are to retire to a quiet room, and there to stretch ourselves at ease; we are to close our eyes and even plug our ears with cotton-wool; in other words, we are to place ourselves in a condition wherein consciousness is at the minimum and subconsciousness is at a maximum. Autosuggestion, then, is suggestion to the subconscious. This raises a very difficult problem. How comes it that consciousness fails and subconsciousness unerringly reaches the desired result? What is the manner in which the subconscious works out the suggestion? Is there any known law under which the process can be subsumed? These are some of the problems which lead us to certain foundation principles of psychology.

## TT

Suggestion should be relative to the type of mind to which it is given. That there are mental types has been recognized variously by various thinkers; and all the classifications have been admirably summed up by Jung in his Analytic Psychology. James divided philosophers into the tough-minded and the tender-minded, and Ostwald classified savants into romantics and classics. From the point of view of aesthetic theory, Warringer distinguished two forms of internal inspiration, viz., sympathy and abstraction; Schiller formulated two types of artists, the naive and the sentimental; and Nietzche contrasted the Apollonian mind with the Dionysian. In psychiatry, Otto Gross

<sup>&</sup>lt;sup>1</sup>Pp. 287-298.

discovered two kinds of debilitated minds, the diffuse and the concentrated. Even from the linguistic point of view, as evidenced by the structure of verbs, Finck observed the active subject in contrast with the passive. But the best classification seems to be the one offered by Jung himself. His psychological types, the introvert and the extrovert, embrace all the others; and what is more, they are based on the very constitution of human minds.

Each of these types has its own marks. An extrovert "gives his fundamental interest to the outer or objective world, and attributes an all-important and essential value to it." To the introvert, on the contrary, "the objective world suffers a sort of depreciation, for the exaltation of the individual himself." Again, "in the one, the fundamental function is feeling, and in the other it is thought. The one feels his way into the object, the other thinks about it. The one adapts himself to his surroundings by feeling, thinking coming later; whilst the other adapts himself by thought preceded by the understanding. The one who feels his way transfers himself to the object; whilst the other withdraws himself from the object to some extent, and reflects about it."

This distinction leads to an important corollary in the matter of suggestion. Concrete imagery would appeal to the extroverted mind; it is not only the medium in which it moves and has its being, but it is also its natural pabulum, and it is most easily assimilable. Moreover, when the suggestion has to be translated into action, it would be able to work in the line of least resistance. Similarly, abstract ideas would appeal to the introvert. The suggestion natural to the one is a synthesis of images, while that natural to the other is a system of ideas.

<sup>&</sup>lt;sup>2-3</sup> Jung, Analytic Psychology, p. 292. <sup>4</sup>Ibid., p. 391.

#### III

Combinations of images may exist in two forms, and the same is true of combinations of ideas. They may be representative or creative. Representative imagery is the reproduction, in the present, of an experience which occurred in the past; its unity is but the mechanical bond of association; and it is what it is, because it just happened to be so. On the other hand, creative imagery, as its very name signifies, is something which was never experienced before, but which is presented to the mind for the first time. An element of personal interest has given it a principle of structure. There is no doubt that the raw materials for both have been obtained from the past. In the case of representative imagery, these are presented in the same order in which they were once experienced. In the latter case, on the other hand, they have been subjected to a process of analysis and elimination; irrelevant materials have been rejected, and the selected ones have been rounded off into a picture in the light of a dominant purpose. A representative imagery is factual and a creative one is ideal in character.

The suggested content should be creative rather than representative. Suggestion is used for purposes either of edification or of cure. That in the first case the picture should be the expression of an ideal is obvious enough. In the second case it is possible to have a representative imagery, but even here it is necessary to use a creative one. The elements which compose a representative picture are held only in loose bonds. Each of these elements has trailed through particular times, places, circumstances, and each carries its own burden of associations. When it is presented, it has the fatal tendency to crowd the mind with its own comrades. Some of these are undesirable, nay positively harmful, guests, especially when the purpose is one of cure. To leave metaphor aside, revival of associa-

tion is generally controlled by an interest. It is the dominant interest of the moment that suppresses some associations and permits others to come up. When there is no particular interest, associations are revived in a choatic manner, and it is emphatically so in the case of a merely representative picture. On the contrary, in a creative picture much that is not wanted has already been excluded. The elements composing it are governed by a dominant purpose, and only those associations which are relevant, that is to say, which are helpful to the present situation, will be allowed to come up before the mind. In either case, then, the picture presented for contemplation should be a creative one.

If the imagery is distinguishable, in respect of its form, into the creative and the representative, it may be classified in a different way in respect of its content. Every student of psychology knows that corresponding to each of the senses there is a kind of imagery. It is on this basis that individuals are described as belonging to particular types, such as the visual, the auditory, the tactual, and so on. The average individual is a mixture, but there are some whose imagery is predominantly of one type. The imagery of the blind, for instance, is predominantly tactual and motor. Since the success of suggestion depends upon the utilisation of the gifts, the potentialities, and the inclinations, of the individual concerned, it is necessary to use, in suggestion, the kind of image which is natural to him. In the case of a man who is a pronounced visual, it may even be necessary to write down the suggestion, in order that he may read it over and over again. The advantages of these methods are indeed obvious. But the prior question is whether the individual subject belongs exclusively to any one type.

IV

Suggestion, if it is to be fruitful, should be conveyed

in a positive form. That a negative suggestion, by reinforcing the very thing which is sought to be removed, defeats its own end, has been well recognised. The best way to remove a pain or to cure a defect is not to make a frontal attack on it but to catch it on the flank. The formula used should not have any direct reference to the pain or defect; it should rather be such as will exclude it altogether. For example, if a man wants to get rid of the pain of tooth-ache, it will not do for him to say to himself, "I have no toothache", for the more this formula is repeated the worse becomes the pain. This is the paradox of the negative. It would appear that there is something in the character of the negative or in that of the subconscious which enables the negative to usurp the function of the positive. On the analogy of the law of reversed effort, which Baudouin formulated in connection with the exercise of will in suggestion, we may describe the usurpation of function by the negative as the law of reversed function—as soon as negative suggestion enters the subconscious it functions as its corresponding positive. This usurpation indeed looks like a mystery.

The usual explanation of this mystery is that the negative formula prevents the outcropping of the subconscious. In the words of a well known disciple of Coué's, pain, "by monopolizing the attention, keeps the conscious mind fully alert and prevents one from attaining the measure of outcropping needful to initiate successfully autosuggestion. . . . . By continually repeating 'I have no pain', the sufferer constantly renews that thought in his mind. Unfortunately, after each repetition the pain thought insinuates itself so that the mind oscillates between 'I have no pain' and 'I have some pain!' "5"

This looks plausible. The negative formula brings to the mind the very idea which it expressly intended to re-

<sup>&</sup>lt;sup>5</sup>Brooks, The Practice of Autosuggestion, p. 101.

move, and this idea is bound to bring its own associations with it and thus make the case worse. But the plausibility of the explanation disappears the moment the issue is clearly stated. The question is not why a negative formula prevents the out-cropping of the subconscious, but why, even after the subconscious state has been attained, the negative suggestion behaves like the positive one. The two judgments, "I have pain," and "I have no pain," have different values; they stand for two distinct acts of thought. If they lead to psychic modifications at all or produce certain results, these should be altogether different from each other; but as a matter of fact we find that they produce exactly the same results in the subconscious. It is admitted on all hands that there is a valid distinction between a positive statement and its corresponding negative; each has its own logical significance; and the logic of the subconscious cannot be different from that of consciousness. Therefore, in explaining the phenomenon of reversed function, due importance should be attached to the significance which a negative undoubtedly possesses.

So much being premised, we may enquire into the nature of the negative. The mental process corresponding to a negative proposition consists of two factors; there is, first, the suggestion of an idea, and there is, secondly, the rejection of this idea. A negative then is a binary compound of two acts, united but distinguishable. When the mind frames the statement, "A is not B," B occurs as a possible predicate of A, but this possibility is immediately rejected. In so far as a negative implies an act of rejection, it is clear that the will is involved as a constituent element. We may even go further and say that the significance of a negative depends to a large extent upon the presence of will along with it; take away the will, and the socalled negative is automatically resolved into a positive suggestion.

To be sure, this is what happens when a negative sug-

gestion is made to the subconscious. The formula is first manufactured on the conscious plane and then handed over to the subconscious. It could continue to have a meaning and value only if the subconscious psychic process corresponding to the assimilation of it implies the presence of will. But we know that will is a mode of consciousness only; in the subconscious it is lacking, hence a negative statement has no meaning so far as the subconscious is concerned. Even though the suggestion of a possible predicate is there, there is no agency of will to reject it, with the result that what was first a negative statement loses its original significance and is metamorphosed into a positive one. It is in this manner that a reversion of function takes place in the case of a negative suggestion.

#### $\overline{\mathbf{V}}$

Suggestion operates efficiently when it is accompanied by faith. "Say it with faith. You can only rob induced autosuggestion of its power in one way—by believing that it is powerless. If you believe this it becomes ipso facto powerless for you. The greater your faith the more radical and the more rapid will be your results." There seems to be some virtue in faith which not only facilitates the process by which results are attained, but also makes it more efficient. To discover what this virtue is it is essential to analyse faith itself.

Faith is an attitude of life. Life is complex, and it has to deal with a still more complex environment called the universe. In its own interest, that is to say in order that life may be lived, it is necessary that its activity should be allowed to go on unimpeded. The fundamental factors which constitute life are reason, feeling and will; and life is lived well only when the pursuit of truth, the enjoyment of beauty and aspiration after the moral ideal are allowed

<sup>&</sup>lt;sup>6</sup>Brooks, loc. cit., p. 87.

to have full scope. Life will be on terms with the universe and will feel at home in it, only on the assurance that the nature of the universe is such as to allow free play for the activities of life. But this assurance is not the result of knowledge, for there is as yet no knowledge. Confronted with the immensity of the universe, life, therefore, assumes an attitude of trust and takes for granted that there is some sort of order in what appears to be a chaos. The trust takes three distinct forms. From the intellectual standpoint it assumes the form that there is reason behind the universe and that, therefore, the universe is knowable; from the standpoint of feeling, it assumes the form that beauty is attainable; and from the point of view of will, it assumes the form that goodness is realisable. The first is known as the postulate of knowledge or the epistemological postulate; the second and the third may be called the postulates of value or the axiological postulates. The general attitude from which the special forms of trust issue is based either on unknown facts or on facts known only partially. In brief, faith is the fundamental postulate of life.

Faith is prophetic. When it is present, the mind looks forward to something to happen—a behaviour, an incident, an action. The best types of anticipation with which we are familiar in every day life is prospective attention. If we would enlarge this particular kind of attention, so as to make it cover all the aspects of life and render it into a life-pose, we can, in some measure, visualize the attitude denoted by faith. In this attitude we become capable of a keenness of observation and a sensitiveness of response not otherwise possible. Expectancy is at once mental and physical. In the first place, the mind is set in tune with the environment, so that any, even the slightest and most delicate occurrence is immediately noticed, caught and assimilated; in the second place, the body is kept in a condition of full preparedness so that, even before it is called

upon to act, it has already commenced acting. Whatever be the experience anticipated, whether it be the awareness of what goes on outside, as in the case of the mind, or the operation on external objects, as in the case of the body, it could not arise but for the expectant attitude of the organism. In this manner both mind and body contribute to the very making of experiences. Installed at the head of the movement, faith is able, if we may say so, to meet new experiences half-way, or, if the expression be preferred, to create its own objects. It is especially so when the experience which is looked forward to is personal in nature, for in this case expectancy amounts to the very pressing of the spring which releases the desired movement.

The application of this to the question of suggestion is now clear. Faith in the suggestion makes the mind alert, gives a tilt to it, and launches it in the desired direction. It is thus an important agency which is responsible for bringing about the process by which results are obtained. In the absence of faith, the individual remains listless, with the consequence that the suggestion falls flat and is not able to influence the mind to any appreciable extent.

The language of faith is that of the present. Faith is not a mere resolution waiting to be translated into action in some remote future. In tuning up mind and body and by giving them an expectant outlook, it has put them on the way to the realisation of the suggestion. In other words, faith is dynamic and operates here and now. The formula used in the suggestion is therefore expressed in the present tense. The present tense is not so much the condition as it is the sign of the existence of faith. This is why Coué's formula is always "I am getting better and better," and not "I shall get better and better".

## VI

Suggestion is addressed to the subconscious. In waking

life the subconscious behaves like a fugitive. It eludes grasp and is not easily accessible. But there are conditions under which it slowly emerges to the surface. To retire into a room and to assume an attitude of complete repose: to close the eyes and to plug the ears and thus to exclude all distractions; to think of nothing in particular but to let the mind wander freely—these are some of the artificial ways in which the subconscious is coaxed into the light. There are even moments when the subconscious emerges naturally. In that hazy, drowsy, nebulous condition which immediately precedes sleep, or which immediately follows waking, consciousness is at the minimum and the subconscious is at the maximum, in respect of existence and function. This phenomenon of the receding of consciousness in the background and the advance of subconsciousness in the foreground, is called by Baudouin by the expressive name of "the out-cropping of the subconscious." Whether this out-cropping is brought about naturally or with artificial aid, it is the essential preliminary to any process of suggestion.

It is the subconscious alone that is capable of translating a suggestion into action. Of instincts of all kinds, of tendencies and abilities, inherited from the race or acquired by the individual, of the vast network of associations in which past experience has been conserved, it is the sole repository; and all this is charged with emotion, so that the whole of the subconscious may be said to have a force of impulsion. Hence it is like a power-house from which any amount of energy may be drafted for any particular purpose towards which it is tactfully directed. In point of fact, it is the subconscious which manifests itself in the details of life. But the world does a certain violence to it, so that to the world it appears in the crippled form called consciousness. Being in the zone of adaptability, that is to say, of interaction between the primordial life-impulse and the intractable environment, consciousness has to attend to various interests—it is distracted in many ways; it has to battle against adverse circumstances, and is torn by internal factions. No wonder that the modicum of energy with which it started to meet the world is dissipated and ultimately exhausted. The subconscious has tremendous power, whilst consciousness has not energy enough to be employed in the difficult task of converting into a fact what is only

suggested as an idea or image.

The key to unlock this power is imagination. When images are suggested to subconsciousness, it acts upon them in a fancy-free process. Away from the distractions of the world, unworried by clamant environments, it moves freely in the realm of imagination. It brings the latter in proper relations with those ideas and movements which are vitally connected with the desired results. It refuses to be coerced; and if by some accident the will strives to direct its operations, it turns its back and disappears altogether. In this situation the will is nearly impotent. Will lives in the midst of struggle; and all its efforts are directed towards the removal of difficulties, so that its energy is frittered away. Instead of reinforcing the original suggestion, it draws attention to the undetected impediments of the mind and brings them prominently to the surface. This suicidal tendency is exemplified most in the case of a negative suggestion. When it puts forth effort to comper the mind, for instance, to the no-pain idea, it really makes it concentrate on the very idea of pain which it is the purpose of the suggestion to overcome; while it has been parleying with the first, imagination has caught hold of the second. During all the time in which it has been "butting against a dead wall," the undesired idea has established itself. This self-defeating tendency of the will has been described as the law of reversed effort-"when the imagination and the will are in conflict, the imagination invariably gains the day." Whether they work separately, the one in the realm of the subconscious, the other in that of the conscious, or whether they clash against each other, as in the case of a negative suggestion, the superiority of imagination over will is evident.

#### VII

What is the law according to which a suggestion brings about necessary changes in the organism? According to the text-books, the law which operates here is that of association. The suggested picture, we are told, taken either as a unitary whole, or as consisting of certain elements, revives a series of associations; in this way image is linked with image, and image with motor tendencies. Consequently the idea of movement, to put it in general terms, brings about the movement itself. This is no doubt true so far as it goes, but it does not go very far. Association can work only in the sphere of habit. If the suggestion in question was experienced before, if, that is to say, it is a repetition of what occurred in the past, then association can no doubt account for the results.

But suggestion has another function. It brings about changes altogether new, and these are not covered by habit and association. The problem is really one of accomodation: how for the first time, does the subconscious succeed in reproducing the image presented to it? Imitation being the best type of accomodation, we shall perhaps be able to find a solution if we analyse the process of imitation itself. The child notices the movements of an adult; this acts as a stimulus which issues in a motor response. When the imitated object is complex, and when reproduction requires persistent effort, the process goes on as a circular activity. Baldwin has given a clear exposition of this process, and it is worth while to quote him in detail. "The essential thing in imitation, over and above simple ideo-

motorsuggestion is that the stimulus starts a motor process which tends to reproduce the stimulus and, through it, the motor process again. From the physiological side we have a circular activity—sensor, motor; sensor, motor: and from the psychological side we have a similar circle—reality, image, movement; reality, image, movement, etc."

In imitation of this kind "the first reaction is not repeated. Hence we must suppose the development of a function of co-ordination by which the two regions excited respectively by the original suggestion and the reaction first made, coalesce in a common more voluminous and intense stimulation of the motor centre. A movement is thus produced which, by reason of its greater mass and diffusion, includes more of the elements of the movement seen and copied. This is again reported . . . . giving a new excitement, which is again co-ordinated with the original stimulation and with the after-effects of the earlier imitations. The result is another motor stimulation of still greater mass and diffusion, which includes yet more elements of the 'copy'. And so on, until simply by its increased mass, including the motor excitement of attention itself—by the greater range and variety of the motor elements thus innervated—in short by the excess discharge, the 'copy' is completely reproduced."8 The subconscious realises the ideal presented in suggestion in precisely the same way in which a copy is reproduced by the child mind, or, more generally, in which an organism adapts itself to a complex condition of stimulus. We are warranted, therefore, in concluding that the law under which the activity of the subconscious may be subsumed is that of accomodation.

# VIII

There is one thing about the subconscious which has been often admired but seldom explained, namely, the

<sup>&</sup>lt;sup>7</sup>J. M. Baldwin, Mental Development, p. 126. <sup>8</sup>Ibid., p. 430.

note of genius in its activity. This is so interesting that no apology is needed for lingering a while on the topic. What is genius? When Goethe observed that "the first and last thing demanded of a genius is love of truth", and when Schopenhauer described genius as "the completest objectivity of mind", 10 they seem to have noticed only two aspects of it, and it is necessary to add that "the degree of love in a man is the measure of the genius he possesses". 11 Wherever it expresses itself, whether in art, morals, religion, philosophy, or science, genius discloses three dominant characteristics—love, truth and contemplation. Love gives it an unique attitude towards its object, truth is the end which it pursues, and contemplation is its method.

Without entering into the psychology of sentiments, we may describe love, in general terms, as the desire for the perfect existence of its object, whatever its object be. Love stands up for the right of its object to live and grow according to the ideal immanent in it; it recognizes that the object has a worth, intrinsic to itself, which ought not to be subordinated to any consideration of external utility; and in the eye of love, no quality is a waste, nothing is indifferent, and everything has a place in the harmony of the whole. Therefore love not only idealizes, but also idolizes, its object. To love a thing, and to desire that it should continue to exist in rising grades of perfection, are, in strictness of language, two ways of expressing the same attitude. "Be ve perfect as your father in heaven is perfect," urges the Founder of our Faith. Weak human nature turned pale at this command, therefore He explained Himself in clearer terms, "Love ye one another."

Truth has reference to reality. Our ideal is called true when it accords completely with the reality of which it is the idea. This happens only when all the aspects and parts

<sup>&</sup>lt;sup>9</sup>Criticisms, Reflections and Maxims, p. 224. <sup>10</sup>The World as Will and Idea, Vol. I, p. 240. <sup>11</sup>Turck, Man of Genius, p.3.

of the object are attended to and their values recognized. Ordinarily this is not possible. Practical life is governed by certain interests impelled by needs, and tainted by many prejudices; for this reason our vision becomes blurred, our notions twisted, and our judgments warped; consequently reality undergoes a sort of depreciation and diminution. It appears not as it is but rather as material for the satisfaction of a personal interest, and we see in it only what we need and we ignore what is irrelevant. To a hunter, for instance, a gazelle is so much of delicious venison, and nothing more. All this is rooted in a more fundamental distinction—the distinction between the self and what is not self. It would appear that this distinction is due to a natural defect in consciousness itself. Wherever consciousness functions there arises this dichotomy, with the result that the object is always externalized. Consciousness can thus yield at best knowledge about a thing. But truth implies acquaintance with reality; if this is so, then consciousness should be held incapable of yielding truth. Modifying Bergson's dictum slightly, we may remark that the more efficiently consciousness works the farther away we are from reality.

Acquaintance with reality is gained only by transcending consciousness; and this is what happens in contemplation. To rise above personal interests, selfishness, and egoism; to transport ourselves into the heart of the object by an act of sympathetic insight; to live and move within it; to pulsate with its life; to feel as it feels itself—this is to contemplate. In this condition, the distinction between the self and the object vanishes and the two become united in one experience. It is this state of at-one-ment that Schopenhauer indicated by "the completest objectivity of mind." Call it what you will—mysticism, intuition, contemplation; it is in it that an intimate acquaintance is established betwen the mind and its object; it is by means of it

that the object is completely explored, and it is through it that an inside knowledge of the object is gained. When the mind emerges from contemplation and gives expression to its experience we call it the utterance of genius.

Such or nearly such are the ways in which genius goes to work. The subconscious also adopts these ways. Its very nature gives it a privileged position: it is not handicapped by the distinction between the subject and the object, nor is it vitiated by any kind of narrow personal interest. Hence reality in its eye does not undergo a shrinkage, but appears exactly as it is; and knowledge is not merely a snapshot taken from an external view-point, but an intimate acquaintance developed from inside experience. Even when the object is material in the ordinary sense, the subconscious weaves it into a pleasant process of imagination, continuously operates on it, and holds it before itself; and but for the irruption of consciousness into its sequestered life, it would dally with it forever. When the object happens to be psychical in nature, as in the case of suggestion, it is dissolved, absorbed, and assimilated into itself, so that the suggestion brings about a permanent modification of the whole organism. Here is genius, if it is anywhere. It seems that genius is after all another name for the subconscious working of the mind.

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## A THEORY OF THE UNCONSCIOUS

By a "mind" we certainly mean more than is present to consciousness at a given moment. Not only past cognition, but also past affection and conation, influence my present consciousness. What I shall now like and dislike, what I shall now desire and shun, and even what I shall now perceive and think, are influenced by my past likings, desirings and strivings. Nor need I be conscious of this influence. Early hopes and fears certainly produce habits of emotional reaction that survive long after the original experiences are forgotten. We incline to think, therefore, that past thoughts and feelings and desires must be stored within us in some secret place, whence they exercise a kind of back-stairs influence on all that we do.

But there is much to be said against the view that experiences can be stored and active though no longer conscious. For instance, Mr. G. C. Field and Prof. Laird have forcibly pointed out that experiences are not enduring things that can be stored, but acts which occur and vanish. We may think of cognition as a mental grasping of something, or an asserting or judging. Affect we may think of as a grasping or asserting of value. Conation may be called the attempt to act. But an attempt is itself an act. And a prolonged attempt is a sequence of acts, each stage of which is ever beginning and ceasing.

Experience, then, is a mental act which is cognitive, <sup>1</sup>Mind, Oct., 1922.

affective and conative all in one. We can no more store a mental act than we can store a physical act. A kick occurs and ceases. Having once kicked, the leg does not go on eternally performing the same kick. It may kick again; and the second kick may be like the first, may be qualitatively indistinguishable from the first. But it is numerically distinct. Each kick is a temporal process, with beginning, middle, and end, which differ in character. The whole kick cannot endure; because if it did, its beginning, middle and end would have to exist together. And, if this were so, the kick would not be a process at all. Similarly, then, experiences are processes having beginnings, middles and ends which cannot coexist. And, consequently, we must not suppose that experiences can be stored. Of course, experiences are mere processes. They are processes which, so to speak, bite upon something. They have content, and without content they are nothing, just as carrying is nothing unless it is a carrying of something. That which is carried may survive beyond the carrying, but the act of carrying is a process that ceases.

But though mental acts cannot be stored, it seems true that they leave a trace on *something* or other which *is* stored. Having experienced something, we may remember it; just as, having learned to swim, we may swim again. Swimming strokes are not themselves laid by, as tools are laid by, to be used again; but the skill to perform these strokes certainly is in some sense laid by. Similarly, acts of awareness are not themselves stored; but the power to perform the same kind of act again certainly is in some sense stored. Desires and fears, also, are not themselves stored. But they are clearly the outcome of something or other which endures, which *performs* the desires and fears in regular manners again and again. Moreover, desires and fears themselves leave their mark upon this enduring

something, so that in the future it may act with reference

to its past desires and fears.

What kind of a thing is this "something" which endures? We only know it as that which is the source of conscious processes, and as something which endures and has a structure both innate and alterable. We may describe it as some sort of system of "tendencies" to act, or "dispositions" to perceive, think, feel, desire, and set physiological processes going. But such words as "tendency" and "disposition" tell us nothing but what we already know, and give us no inkling of what a tendency is when it is not acting. Some people venture to say that because this something tends to behave mentally, it must itself be in some sense mental. But in what sense? Bombs behave explosively, but in what sense are they themselves explosive? Clearly, in quite a different sense from that in which their behavior is explosive. In fact, by calling them explosive we mean simply that they may behave explosively. Limbs move, and are called mobile; but they are not themselves motion. Similarly, this unknown something which behaves mentally, and is therefore in a sense called "mental", is not itself thought or desire.

But it is claimed by the protaganists of the unconscious that distinctively mental processes can be proved to have occurred outside consciousness, and that therefore the unconscious must be mental both in structure and function. It is suggested, for instance, that wishes are not essentially conscious. They are processes of the unconscious, and the subject may or may not become aware of them. Moreover, he may be aware of them either correctly or distortedly. He may, that is, have a conscious wish which is derived from, and yet very different from, a deeper wish of which he knows nothing.

Now it is true that one may wish and not also be aware that he is wishing. I may wish my enemy's downfall, and

yet not think about the fact that I am wishing it. For conscious acts may themselves be objects of other conscious acts, or they may not. But whether or not a person is aware that he is wishing, his wishing is itself an act of consciousness. It is simply impossible to conceive of anything which should be a wish and yet not a kind of awareness.

Perhaps, however, I am not doing justice to the theory of the unconscious. Let us therefore consider Levine's account in his recent book, The Unconscious. His argument may, I think, be summarised as follows. He begins by asking, "Is there an activity which can be called mental and which defies complete expression in terms of chemistry or physiology?"2 Introspection, he says, suggests that there is. This activity is said to be the crucial feature revealed in consciousness and in all behavior, and it cannot be explained in terms of any physical science. It is true that the physiological and the mental are very closely connected, that, for instance, the activity of the ductless glands is related to the emotional state. But knowledge of these glands, we are told, can only "amplify our conception of the physical side of unconscious processes. It by no means abolishes the need for a mental state." The nature of mental states and processes, whether conscious or unconscious, can be known only by a study of consciousness itself. And the nature of consciousness, we are told, is as follows. In the first place, it is not a merely passive awareness, a mere reception of stimuli. It is an active "translation or interpretation" of stimuli, and it is "inexplicable unless it be regarded as the result of previous training." But, further, the present response is more than the outcome of the organism's history. It is, (we are told) a choice, a construction, a "selection of innate or acquired response habits," in

<sup>&</sup>lt;sup>2</sup>The Unconscious, p. 79.

<sup>\*</sup>Ibid., p. 81. \*Ibid., p. 89.

such a way that the response forms a unified, integrated whole. Thus (I suppose) when we walk to some chosen destination; or when we perceive certain visual stimuli as being in fact a visible, tactual, audible, smellable dog; or when we solve an intellectual problem; or when we fall in love:—on all these occasions we are making a construction, a selection of response habits, in order to deal adequately with the particular stimuli with which we are faced.

Such, then, is Dr. Levine's account of consciousness. And this kind of activity he says can be proved to take place outside the stream of conscious processes. For the data of consciousness are very incomplete. Mental activities occur which presuppose other mental activities of which there is not awareness. Quoting Freud, he says, "we have ideas whose origins we do not know, and thought products the elaboration of which remains a mystery to us."

Now, apart from the special theories of Freud, it certainly has to be admitted that, in some sense, unconscious elaboration of intellectual matter does occur. A man is perhaps faced with a complicated problem which he cannot solve. In despair, he leaves it and goes about some other business. After a while he comes back to his problem. And though he has not been thinking about it in the meantime, the solution comes now without any effort. Or possibly, even in the midst of his other business, a brilliant idea flashes upon him, and his problem is solved. Clearly, we are told, intellectual processes must have occurred apart from the man's consciousness. We can scarcely say, in such cases as this, that the processes are really conscious, but have been forgotten; for in the meantime the man was perhaps busily behaving with reference to other matters. There is no room for the supposed forgotten processes. Yet I think that it is a mistake to attribute this kind of thing to unconscious mental process. All problems consist in seek-

<sup>&</sup>lt;sup>5</sup>Ibid., p. 92.

ing to coordinate ideas, or facts, or desiderata, that are apparently inconsistent. And it seems to me that the known principles of neural activity are enough to explain the unconscious part of this solving. For the tracts concerned with the two inconsistent ideas may be supposed to remain "warm", and to infect all their mutual associates, and cast them up into consciousness as marginal and negligible thoughts during the absorption in the other business. If now one of these mutual associates is the key idea to the problem, attention may seize upon it. For my part, however, I am not at all convinced that marginally conscious *processes* cannot have been going on all the time, though they have been subsequently forgotten.

But in the Freudian cases I suspect that the origins of ideas are often to be found in past explicit consciousness. The patient may not be now conscious of that past consciousness, although it has left its mark upon the enduring "something" that behaves mentally. Indeed, the past consciousness may be now quite inaccessible owing to some repression, owing to the fact that it is fundamentally inconsistent with some behavior tendency now dominant. Or it may even be that the past consciousness in question was not itself noticed at the time, or attended to. It may have occurred in a day dream, or an "absent-minded" trance, or for that matter it may have occurred in sleep. And as to day dreams, it should be noted that it is often impossible to recapture the content of a day dream, even immediately upon the sudden discovery that one has been dreaming. Have we not all had the experience of suddenly "coming to ourselves" with the knowledge that we have just been absorbed in some theme that is now inaccessible? But if this is so, surely this Freudian argument fails. Surely when behaviour seems to suggest past mental elaboration and vet the elaboration is inaccessible to consciousness, we have no right to assume that there has been unconscious

mental elaboration. On the other hand, we have also no right to assume that, when behaviour looks like the product of mental elaboration, it must necessarily be so. We must first be sure that it cannot possibly be the product of purely physical elaboration.

Dr. Levine and the psychoanalysts claim that the psychological nature of unconscious processes is proved by the fact that cures of mental troubles are made by psychological means, by revealing the psychical content of the unconscious. This argument is far from convincing. Psychoanalysts of very different schools seem to obtain cures by revealing supposed contents of very different natures. Which school is it that has discovered the real unconscious, and which are after all only curing by suggestion?

Levine suggests that the concept of the unconscious is justified by the help it has given to pathological theory. Does it not successfully account for errors, dreams, and mental disorders? Now it may be that this is so, and yet that the concept needs radical alteration on its philosophical side. But also it is impossible not to feel suspicious of the glib plausibility of many psychoanalytical interpretations of these phenomena. Dr. Wohlgemuth has shown how arbitrary many of Freud's own analyses often are, and how great a part is played by suggestion, for instance in the case of Little Hans. But though we must, I think, be very critical of Freud and his followers, we need not pour out the baby with the bath water and deny all value to his work. We may well admit the epoch-making importance of Freud's discovery of the possibility of psychological analysis of the unconscious "something" which is the source of consciousness, and yet suspect that the principles upon which psycho-analysts work, and the theories which they devise, are often moonshine. Let me give one example of a dubious analysis from Levine himself. He

<sup>&</sup>lt;sup>6</sup>In A Critical Examination of Psycho-Analysis.

sent a wedding present to a lady who was to be married on March 25th. She wrote her thanks on February 25th, but post-dated it March 25th. The explanation is said to be that the motive was "obviously one of anticipation or impatience, and it was easy to infer that the lady was happily engaged, and looking forward to the month of her marriage." But surely, since the dominant theme of the letter was a wedding present, all matters connected with the wedding would be very readily called up. Moreover "25th" had an established connection with March. It is such hasty interpretations as this that make one welcome Wohlgemuth's rather ribald but effective attack on the whole system. Has he not given us a delightful bogus interpretation of a biblical dream as though it were a dream of his own?

Of all Levine's arguments for the unconscious the most serious is that which is based on the occurrence of processes, outside consciousness, which seem to be inexplicable in physical terms. Dr. Drever, in a recent paper, has very clearly outlined such an argument. The business of the psychologist, he says, is to study the behaviour of living organisms; and their behaviour includes their conscious processes. But the behaviour of living organisms, at any rate of human organisms, cannot, he thinks, be explained merely in physiological terms. Interests, prejudices, complexes are absolutely essential, and are beyond the scope of physiology. The characteristic of behaviour is that it is integrative, that it is behaviour by the whole organism in relation with its whole past history and its whole present situation. This integration, which physiology cannot fully describe, can be observed "from the inside" by introspection. But integration is the character not only of those processes which we can observe "from the inside", but of

<sup>7</sup>The Unconscious, p. 58.

<sup>\*</sup>Op. cit., p. 95.

"The Nature of Consciousness," Proceedings of the Arist. Soc., 1925,
p. 139.

all behaviour. Consequently, we are forced to postulate "dispositions" toward such integrative behaviour. And these dispositions, innate and acquired, constitute the psychological "unconscious". But we are told to distinguish between conscious process, which is "a real process or event",10 and the "unconscious", which is only "a conceptual construction for explanatory purposes", and is "of a different order from the psychological conscious". But not only, says Drever, must the psychologist postulate this unconscious structure of dispositions; he is forced also to admit, "in the meantime at least", unconscious processes. For we cannot explain events without these. "We must", he says, "assume interaction between the structural elements just noted." And again, "The elements of an individual's mental make-up, whether we regard them as neural or mental structures, must be regarded as parts of the structure of a living organism. As such they cannot but interact with one another, inhibiting, facilitating, modifying the influence of one another." Thus Drever accepts the psychological unconscious as the only adequate means of explaining the facts of behavior, but he insists that it is not "a real process or event," but only "a conceptual construction."

For my part I cannot distinguish between a theory which means to describe a real process and one which describes only a conceptual construction which is meant to be true. If we are to accept the unconscious, let us do so wholeheartedly, and not seem to treat it as a kind of legal fiction. We are often told that if an explanatory concept works, and seems necessary in order to make the facts intelligible, we should accept it, even if it is impossible to form any clear and consistent idea as to what it is that it describes. For instance, we are told that physicists were

<sup>10</sup> Ibid., p. 148.

<sup>&</sup>lt;sup>11</sup>Ibid., p. 149.

justified in postulating "invisible light" because they discovered etherial vibrations longer and shorter than those that are visible. But there is a serious confusion here. For by "invisible light" the physicists mean simply vibrations which do not afford us visual sensa. They do not mean invisible visual sensa. In one case there is a contradiction. and in the other case not. Now the concept of the ether has in it serious inconsistencies. In spite of this, it has certainly proved very successful as a working principle. But we certainly cannot rest content with a principle that is internally incoherent. And it is noteworthy that, owing to its failure to work coherently in the light of the more fundamental principle of relativity, many physicists are now inclined to discard the ether. If we are to adopt every principle which seems superficially to explain the facts, surely we should revert to crude animism in every case of perplexity. And indeed the concept of the unconscious is simply a reversion to animism of a very inconsistent type. It postulates an entity which it can only describe as neither physical nor conscious, as something which, to quote Mr. Field again, has no qualities.

Another defence of the unconscious consists in an appeal to the principle of continuity. Just as we have to infer particles of matter too small to be observed, so (the argument runs) we have to infer mental occurrences too faint to be observed. Practice in introspection leads to the discovery of many mental processes that were before inaccessible to consciousness. And it is always possible that there are other mental facts which not even an ideally perfect introspection could reach. If then, for other reasons, we need to postulate such processes, our inability to observe them is no argument against them. To this we must reply that processes that occurred but were not introspected were not unconscious in any strict sense. They were merely unnoticed. The striking of the clock may not be noticed

till it is past; but when we do notice it, what we notice is that we did hear it. It was *sub*conscious, if you like, but not *un*conscious, any more than unobserved matter is immaterial matter. The Freudian unconscious, however, is said to be in no sense at all conscious.

Doubtless Drever, though he postulates mere conceptual constructions, does not mean to hedge. He means only to insist that consciousness is determined largely by something, beyond itself, which (whatever it may turn out to be) cannot be described in the language of physical science, and yet is of a different order from consciousness. And certainly it is tempting to think that this is so. But there is another possibility. This unknown factor may be neither purely physical nor purely mental, nor of some unsuspected nature different from either. It may be no one simple thing at all, but a complex of the physical and the mental.

We are trying to account for certain kinds of physical and psychical behaviour in human organisms. But what is an organism? We know it as the sum of its manifestations, the sum, that is, of its appearances, its physical behaviour, and its introspected or inferred conscious processes. But the organism, as we know it, is more than an aggregate. It is an intimately interconnected whole or system of appearances, physical acts, and conscious processes. Every element in it seeks to be intrinsically related with every other element, whether physical or psychical, whether present or past. It is just this integration that constitutes it an organism. It is because its manifestations are thus integrative that we call it organic.

Now in some sense the organism is supra-temporal, at least on its psychical side. This seems to be proved by the nature of ordinary memory. We may of course, with Bertrand Russell, fancifully postulate that all memory is an illusion, that there never was anything before this specious present, though we all seem to remember past experiences.

But such a radical denial of the reality of pastness denies also the flux, or passage, which we observe in the specious present itself. We cannot deny the validity of memory (in principle, and apart from error) without denying also the whole of our experience. And, as Bosanquet very clearly showed,12 if we take memory seriously, we must admit that in true memory what we have is no mere copy of the past event, but the past event itself. If all our memories are copies. how do we know that there were events of which they are copies, and that the events were like the copies? The essence of memory is given in such statements as "I, who am now, was then," or "I, who am now, hold what was then." In fact, if memory is to be taken seriously, it is a grasping of past events again from the present. When we remember, then, we are both past and present, and in an important sense supra-temporal. We are a unity of pasts in a present. This may seem to deny the contention that past acts of consciousness are irrevocable. But it does not. It only implies that what is past can be grasped again in a new act. And past acts may become objects of succeeding acts.

There is good reason for saying that we are enabled to remember the past by means of a present neural trace. It is only through the turnstile, so to speak, of a present neural trace that we can revisit the past, and know it as past. In the time between the original event and our remembering it, the neural trace endured, but consciousness was not utilizing it. It is a mistake to say that we had an unconscious memory all the while. We had only a possibility of remembering. That is to say, there was, in fact, all the while a neural structure through which we might revisit the past event. Of course, we are often influenced by past experiences even while we are not explicitly remembering them. Present perception, and thought, and desire, are all qualified by an unremembered past. Such facts we must account

<sup>12</sup>Three Chapters on the Nature of Mind, p. 105 ff.

for by saying once more that a physical trace enables us to revert to the past. But it enables us only to apprehend certain general characters of many past experiences, such as, in the case of perception, the general principles of perspective, and in the case of desire, the general character of many past value-judgments. Moreover, we do not, as in explicit memory, attend to the pastness of these experiences. We do not, so to speak, regard them from the point of view of the present. On the contrary, from the point of view of the past, we attend to and interpret the present. In explicit memory we attend to the past as such. In present perception, thought, desire, we attend to present events; but we can only interpret them by means of principles or general characters derived from the past, and now operating in the present.

If this account is correct, the cooperation of physical and psychical activity in behaviour is very intimate. For without neural activity the way to the past is blocked, and without conscious activity there is nothing which can utilize the neural gates to the past. We must not, then, expect to explain behaviour solely in terms of neural activity, or solely in term of consciousness. Nor, when each of these proves insufficient, should we try to supplement both by unconscious mental process. Rather we should try to discover in every case what kind of function is performed on the side of neural activity and what on the side of the activity of consciousness, and how the two combine to produce the complex fact of behaviour. It used to be thought that there was a physical thing, the body, and a psychical thing, the mind or self, and that one of the problems of psychology was to show the relation of these two. We might adopt the account of paralellism, and try to show that each worked in complete independence of the other, though every change in the one corresponded to a change in the other. Or we might adopt interactionism, and hold that, though each had

its own processes, the processes of each were definitely influenced at certain points by the processes of the other. But, as Drever has insisted, this radical dualism is false. The living organism does not consist of a body and a self. Nor is it a physical thing which acts not only physically. but psychically also. Nor is it a psychical something which acts not only psychically, but physically also. The living organism is observed to be a psycho-physical system of physical processes and conscious processes, which are internally related to each other. We may in theory abstract the one from the other; but in doing so we violate the nature of each if we suppose that either is anything without the other. Psychical and physical, then, are involved together. They are but the inside aspect and the outside aspect of the same organism. But some processes are initiated on the physical side, and some on the psychical. Distinctive kinds of acts are initiated by neural activity and by conscious activity. In other words, to understand behaviour we need both physical laws and psychological laws.

This view suggests some kind of "emergence" theory. For we may suppose that at certain stages in evolution new principles have come into operation not predictable from the manifested nature of earlier entities. Thus we may suppose that, from certain patterns of the physical, processes of a new order, namely the psychological, have emerged; and that these processes, once they have emerged, react upon the physical, "in their own right," so to speak. This need not mean that something absolutely new has been injected into the universe. It may mean that something which hitherto had manifested itself as purely physical, was only enabled to manifest its fuller, psychological nature when a certain physical organization had been reached.

How then shall we describe from the psychological point of view the special office of neural activity, and the special office of the activity of consciousness? We shall certainly have to make some use of the doctrine that neural traces are in some sense vehicles or instruments of consciousness. And this doctrine is often criticised as being an unjustifiable and useless lapse into physiology. Yet I think that it is by now clear that in some sense consciousness is limited by the limitations of neural activity. The cerebral lesions connected with the various aphasias are enough to make this seem at least very probable. And if this localized relationship between consciousness and nerves is once granted in principle, we are entitled to use it, even if we know very little about its detailed application.

In the first place, then, it seems that without neural activity there can be no consciousness; not because nerve secretes consciousness as liver secretes bile, but because without neural activity there can be no content for consciousness. The objects of consciousness are given through neural activity. In the second place, these objects are integrated. Now, doubtless there is a neural side of integration. The whole of a neural area may perhaps vibrate to many impulses, like a pond, the whole of which ripples with a criss-cross pattern when many stones are flung into it. But the more intimate unity of apperception itself is the work of consciousness alone. Many objects are known at once, and each is known in relation with others. Within this unity of apperception consciousness judges, observes differences and likenesses, and makes all kinds of true and false assertions. This, I suggest, is definitely the activity of consciousness. It has, doubtless, a neural side, but it is initiated not physically, but in consciousness itself. Nerves may present material, but the act of knowing or judging is a conscious act of the organism. But this critical cognitive activity has indeed its neural side, and leaves a "neural trace." For, neural structure persists in an altered form after every neural activity, and has an increased facility for performing that kind of act again. And when that kind of an act is performed again (whether owing to external or internal stimulation) the object of the previous act is grasped again in apperceptional unity with the present situation. Or possibly the previous act itself may be thus grasped as an object. To sum up, neural activity affords access to the present and the past; the activity of consciousness integrates in apperception, judges, and alters neural activity by its inventions.

But so far we have considered only cognition. What are the respective functions of neural and conscious activity in affection and conation?

We said that the living organism tends to behave in specific manners in relation to its environment. Some of its behaviour is observable only externally in its physical manifestation, some is observable only "from the inside" (as Drever says) by introspection, and some is observable in both ways. When we say that the organism has certain behaviour tendencies, we mean that the supra-temporal system of physical and psychical manifestations which is the organism does in fact fulfill certain principles of behaviour. When we say that animals with empty stomachs tend to eat, we mean simply that it is observed that they do eat unless something prevents them. Now eating can be observed by introspection. It consists of sense perception, voluntary activity and pleasant feeling. When the organism is prevented from eating, the tendency may be manifested on the conscious side in other conscious processes, such as the pangs of hunger, a vague restlessness, or the explicit desire to eat. But if it does not become a conscious desire, it is no desire at all, just as on the physical side, if it does not become physical movement, it is no movement at all. Tendencies are not movements, nor are they wishes. are principles or laws observed to hold of behaviour. And when the ordinary result is prevented, other regular results occur. And on the psychical side one result may be that, through a neural activity, there occurs a conscious apprehension of the kind of object that is needed, and so a wish for that object. This account suggests that a tendency should be thought of not as an entity describable only as potential activity, but as itself consisting in a system of obscure actual activities, which may under certain circumstances give place to other overt actual activities, namely those activities which are "potential" in the tendency. This falls in line with the physicists' attempt to state all potential energy in terms of other kinetic energy. Every kinetic energy is, so to speak, potentially other forms of kinetic energy. And in the psychological sphere a tendency is a system of physical and psychical facts which are "potentially" other physical and psychical facts; that is to say merely that they may give place to these other phenomena.

It is perhaps useful to distinguish between a wish and a need. A person may be said to need something even when he has no knowledge of what it is that he needs, and so has no wish for the thing. A tendency, even a strictly physical tendency, may be said to need certain conditions for its fulfillment, without our implying that there is any consciousness of what those conditions are. Similarly with the organism, the acts or objects which would in fact enable the fulfillment of its nature may not happen to be known. We may be in a state of unrest, and not know what would give us peace. We need something specific; but it is a mistake to say that we have an unconscious wish for that thing. Yet after all a need, no less than a wish. involves some kind of reference to consciousness. A need is, so to speak, a potential wish. It is what anyone would wish, if he wanted a certain tendency fulfilled, and if he knew how it could be fulfilled

This suggests the answer to our question about neural and conscious activity in respect of conation and affect.

For though tendencies have a physical side in neural structure and function, valuing is a strictly conscious activity. This does not mean that values are merely subjective or arbitrary. Values, I suggest, emerge from the nature of the total experienced situation, including the organism itself; but they are apprehended as values only in conscious affective and conative experience. Thus not only does the organism on its physical side tend to act in certain manners, but also on its psychical side it tends to pass value judgments on situations in respect of their furthering or thwarting its felt needs. Its needs are felt through the instrumentality of neural activity. But they are not simply imposed upon it by the operation of physical events, for those physical (neural) events are themselves the expression. in part at least, of the organism's total nature, including its past value experiences. The organism values primarily free-functioning. But the direction in which it can function freely is determined partly by prior psychological facts, though through the medium of present neural structure. For I suggest that this valuing activity, which is essentially conscious, does definitely have a neural side, and so a lasting effect on neural structure. And this neural side of the valuing activity has itself two distinct aspects. On the one hand, it is through the renewed activity of a neural trace that the organism may revert on future occasions to its original value experience. On the other hand, it seems to me, conscious valuation results in a selection of neural patterns of response, an efficient choice of behaviour.

First, then, with regard to the redintegration of past value experiences, we must note that, as with pure cognition, this may be either explicit memory or subconscious determination of the present by the past. That is to say, the past context may not be redintegrated, owing either to simple oblivescence, or to active repression by some dominant tendency which is incompatible with memory of the origi-

nal incident. (The neural side of repression we must think of in somewhat the same terms as the antagonism of muscular innervations). But though the past context is not redintegrated, neural activity connected with emotional states may redintegrate the original value feeling as an objectless affect. One possible source of such a trouble may be that certain organic reflexes may afford a particular organic resonance which in the past had occurred along with certain intense value experiences. This resonance may redintegrate an objectless value feeling which may perhaps be erroneously referred to the present situation.

With regard to the effects of conscious choice, the common sense view is that physical changes really are brought about by our choosing. And according to Levine, as we saw, conscious activity is really a "selection of innate and acquired response babits." It seems to me that we have no right to Gray the evidence of introspection here; and introspectice ertainly suggests that this is the case. But we must beware. This conscious choosing is not indeterminate, arbitrary. It is choice determined strictly in relation to the organism's felt tendencies and past experience and the present total situation. These, however, are not its only determinants. To a greater or less extent (according to the person's particular capacity) choice is determined in relation to the findings of intelligence in its critical operation upon the world and the organism itself. Now the medium in which alone this kind of determination can take place is conscious activity. It is, in fact, determination of behaviour by conscious activity in the light of the whole cognized situation. The point is that without consciousness there would be no such determination, no such integrative action shaped toward the attainment of ends. Nor would there be any critical modification of ends.

Intelligence and valuation, then, are activities of consciousness; and they influence the course of neural activity,

and so the course of overt behaviour. But valuation, I admitted, is determined in relation to the present neural situation. We must remember, however, that the present neural situation is not *merely* the outcome of the operation of physical laws. It is itself largely the product of past conscious activity. And, moreover, present conscious activity, besides being influenced by present neural tensions, is enabled, by the mere instrumentality of neural activity, to live again the past, and act in relation to past value experiences.

If the foregoing account of the neural and conscious factors in behaviour is correct, how must we think of the supposed manifestations of unconscious yet mental activity? The only course open to us is to hold that in such behaviour all that is necessarily due to mental activity must be attributed to past consciousness, whether explicit or marginal, and that, owing to repression, this past consciousness is no longer accessible; while all that is necessarily unconscious in such behaviour is present neural activity. Now it is certainly difficult to explain, in such terms, behaviour which is apparently not rigidly mechanical, but seems to vary (according to the needs of the moment) in relation to a desire which nevertheless is not present to consciousness. Much, however, of the evidence which is said to imply unconscious mental activity can, I think, be explained in other terms. It is, perhaps, worth while to consider one instance, a dream cited by Dr. McCurdy18 with the express purpose of proving that there is unconscious reasoning. During the day before the dream, Dr. McCurdy had read a newspaper paragraph on the frequency of dermatitis in Mah Jong players. It was pointed out also that the laquer used on Mah Jong pieces was obtained from a plant related to poison ivy, which itself produces dermatitis. No conscious thoughts relevant to the dream occurred (so we are

<sup>13</sup> The Psychology of Emotion, p. 534.

told) between the reading of the paragraph and sleep. In the dream McCurdy saw his own forearm and the back of his hand covered with an eruption. On the hand alone the eruption took the form of a criss-cross pattern. In the dream he thought that it might be eczema or poison ivy, and then that the lesions were certainly poison ivy. On waking he realized that the figure on the hand was like a Chinese character, and concluded that it was, therefore, meant for Mah Jong dermatitis. Now poison ivy affects only the arms and backs of hands, not the tougher palms and fingers. Mah Jong players would mostly touch the pieces only with their fingers; but they might rub with their infected fingers the tender backs of their hands where alone the disease could occur. This reasoning, according to McCurdy, was performed in the unconscious, and symbolically expressed in the dream by the Chinese figure on the back of the hand.

To this argument the first objection is that McCurdy certainly cannot be sure that he had no conscious thoughts of this nature before sleep. He says there was no reason why such thoughts, if they occurred, should have been repressed. But is it not a mistake to suppose that only repressed thoughts are irrecoverable? Surely very many thoughts are irrecoverable by ordinary consciousness simply because they occur in absent-minded states, when we do not sufficiently attend to them. If any one were to ask me what I was thinking of during breakfast this morning I certainly could not say.

But secondly, let us suppose there was in fact no conscious thinking from which the dream could be derived. Does the dream necessarily express a thought process? All it does is to present in image the natural form of poison ivy dermatitis, on the arm and back of the hand, and also to stamp with a Chinese character that region (the hand), which was most nearly connected with the game. Surely

this is a very natural resultant of the two sources of the dream. The reasoning has been "read into" the dream by awakened consciousness. One cannot but suspect that very much "unconscious thinking" should be accounted for in this manner.

If we were to be confronted with behaviour that could not be explained in this way, we should have to deal with it somewhat as follows. We should have to suppose that, either through the pure innate character of the organism or through modification by past conscious activity, some kind of neural mechanism had been set up which automatically regulated behaviour toward a certain end. Such teleological machinery we know in the governor balls that regulate some steam engines, or the proposed aeroplane which should automatically keep its balance and direct a course in spite of veering winds. Such a neural mechanism might, perhaps, drive and entice conscious deliberate activity toward a certain "unconscious" goal, by affording it pleasurable and painful "objectless affects" according to its approximation to, and straying from, the goal. On the one hand the goal might be a purely instinctive goal. That is to say the organism might be so fashioned, innately, that it could in fact only fulfil itself by achieving this goal, although it might have no knowledge whatever of the goal which alone would satisfy it. Or, on the other hand, the goal might be determined in part by past consciousness, now forgotten, this past conscious activity being the source of the present "governing" affects, which would arise through redintegrative mechanism of the nervous system. In neither case is the explanation merely in terms of neural mechanism. Such mechanism is only the bridge between, on the one hand, present consciousness, and, on the other, the past consciousness of the individual or the past psychological nature of the race. Such an explanation would need very careful working out, and might prove insufficient.

But, on the face of it, it appears less objectionable than the meaningless concept of unconscious yet mental activity.

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## LITERARY CRITICISM AND THE STUDY OF THE UNCONSCIOUS

THE problem that I propose to discuss in this article lies on the borderland common to students of literature, of psychology and of philosophy. I shall approach it by a consideration of the relevant parts of Mr. Thorburn's discussion in his recent book: Art and the Unconscious.1 I shall also make use of the book by Professor Prescott: The Poetic Mind. Professor Prescott in his preface sets forth his intention of studying the operation of the poet's mind, by the methods of the student of literature who lacks psychological training. He will collect and correlate the sayings of the poets themselves as to the workings of their own minds. He will leave it to psychologists to make the best final use of the material collected. Mr. Thorburn writes as a philosopher, considering the problem of art and its value in relation to general philosophical theory, but approaching it in the light of recent psychological studies. He takes the whole field of art as his province, and, relying upon the unity of the artist's attitude through all its different manifestations, chooses examples from whatever sphere of art may best illustrate his argument. He believes that in the new methods which have been applied by Freud, Jung and others, to the study of the unconscious forces of mind, there may be found clues to a deeper under-

<sup>&</sup>lt;sup>1</sup>John M. Thorburn, Art and the Unconscious, A Psychological Approach to a Problem of Philosophy, Kegan Paul, 1925. <sup>2</sup>Frederick Clarke Prescott, The Poetic Mind, Macmillan, 1922.

standing of the nature and value of all forms of artistic

expression.

The wide range and interest of the questions considered by Mr. Thorburn, and the fact that so little work has yet been done along these lines, makes it seem profitable to take up some of his problems in more restricted fashion. I shall here consider the question with which Mr. Thorburn opens his discussion—the question as to how far the study of the unconscious, through dreams and otherwise, can throw light upon the nature of poetry and all forms of imaginative literature.

My enquiry will be governed by the same presupposition which is suggested by Mr. Thorburn when he urges that the art critic misses the deepest, most interesting and most real thing about poetry and the arts, if he is unable to relate the arts to life. To relate art to life implies that we must be able in some degree "to trace the psychological path along which the artist passes from his own experience of men and women and nature to his creative work as artist." (p. 20). The belief that the critic of literature needs such psychological insight may be challenged on various grounds. It has been challenged in a witty and delightful little essay by E. M. Forster,3 on the ground that any consideration of the personality of an author must be a distraction from his work, if his work is true literature. Literature comes from the depths below personality. To enquire about the personality means gossip as to the author's mode of life and private opinions, that have nothing to do with the art he creates. The answer to this objection can perhaps be made more adequately at a later stage of this discussion. At present I refer to it only for the sake of defining more clearly the manner in which I am assuming that psychology may aid literary criticism. Certainly I agree, and so would Mr. Thorburn, with Mr. Forster's

<sup>&</sup>lt;sup>8</sup>Anonymity: An Enquiry, The Hogarth Press, 1925.

contention that the work of art comes from a deeper level than that of the surface personality, concerning which biographers may collect gossip. Yet I think the study of poetry must convince us that what happens even at that deeper level is not independent of the experience and distinctive strivings of the individual, and of the age in which he lives. Mr. Thorburn speaks of poetry as expressing a "vital attitude," (p. 20) and it is this attitude, or outlook upon life, which we come to know through the work itself, that we may try to understand further in relation to the history of the poet and of his time. If the study of the unconscious by the new analytical methods can help us to understand anything more of the workings of the mind at its deeper levels-of the way in which "vital attitudes" are conditioned and expressed—we believe that such knowledge must be of value to literary criticism.

In his initial presentation of the analogy between art and dream Mr. Thorburn considers first the relation between the dream and the ideas of waking life. A man has certain conscious thoughts and aims; he falls asleep, and when he wakes his accustomed thoughts again present themselves, but in contrast to them he recalls that in the interval of sleep strange images have occupied his mind images perhaps of events and scenes of childhood, or of things monstrous and bizarre, seemingly irrelevant to his waking thoughts. Have these images any discoverable relation to the ideas and purposes of waking life? To answer this question we rely upon some process of interpretation involving concentration upon the impressions of the dream and search for the associations of its several parts. Different students of the dream, relying upon different presuppositions, have arrived at varying conclusions as the result of such search. Mr. Thorburn accepts the presuppositions of Dr. Jung, and has found evidence in his own experience

of the value of his methods. There is a wonder and sense of conviction that arises in the mind of one who has analysed a dream of his own, and felt its queer images become intelligible, yielding up secrets of his own life, displaying as in a picture thoughts and motives that he had only glimpsed in the obscure experiences of action. The technique that has helped a man to such a vision becomes for him no longer mere matter of argument, but a serviceable instrument of his understanding of himself. It is upon the basis of such experience that Mr. Thorburn formulates the relation which he believes exists between the dream and the ideas of waking life.

One is disposed to demand of any writer who bases conclusions upon dream analysis, that he should present some illustration of his method from his own experiences. Mr. Thorburn gives illustration only in somewhat general terms. The attempted interpretation of a single dream is seldom convincing when it cannot be related to that whole tissue of thought and feeling, and to the distinctive modes of representation, that appear as one interpreted dream is compared with others. In spite of this difficulty, I wish to describe here a dream of my own with some attempt at its analysis. But before doing so I will indicate, on the basis of Mr. Thorburn's discussion, the conclusions concerning the analogy between poetry and dream which I propose to examine with the help of examples.

Mr. Thorburn refers first to the character most obviously common to the dream and to the work of dramatic poet or novelist—the occurrence of figures that seem to act from their own spontaneity. The "denizens of the dream" are "centres of vitality whose self-motion is not to be controlled by the dreamer." (p. 13) The characters by means of which the playwright, or novelist, works out his intention will, "if he be a real poet," "present themselves with a certain degree of spontaneity." (p. 27) This analogy be-

tween drama and dream is, in Professor Prescott's book, developed with considerable detail of example. Professor Prescott also brings out, through his quotations and examples, that the persons both of dream and of drama seem to represent—in Mr. Thorburn's phrase—"capacities for life" on the part of dreamer or dramatist. Thus he quotes the statement of Havelock Ellis, that the "process by which dreams are formed through the splitting of the dreamer's personality for the construction of other personalities has been recognized ever since dreams began to be seriously studied." On the other side of the analogy, he gives, among other instances, that of a dramatist, M. de Curel, who tells how the persons of his play speak and move before him, and describes them as a sort of "budding of his primary personality; into which they gradually, though not without some painful struggle, re-enter after the play is finished." (p. 200).

An attractive subject for further investigation is presented in the relation thus recognized between the spontaneously evolving figures of drama and dream and the individuality of the mind before which they appear. Prescott offers evidence which seems to show that, even in cases where the figures portrayed appear derived rather from observation than from inner experience, there may have taken place the process which Mr. Thorburn describes as "dreaming through objects." He quotes the description by Balzac of listening to the talk of working men and women on the boulevards: "Hearing these people I was able to adopt their life; I felt their rags on my back, I walked along with my feet in their worn-out shoes: their desires, their wants, all passed into my soul and my soul passed into theirs: I was like a man dreaming while he is awake."

<sup>&</sup>lt;sup>4</sup>H. Ellis, The World of Dreams, p. 196.
<sup>5</sup>Quoted from A. Binet, L'Annee Psychologique, 1, 1894, p. 124.
<sup>6</sup>Art and the Unconscious, p. 104.
<sup>7</sup>"Facino Cane", quoted in The Poetic Mind, p. 209.

But there is a further question which must be considered in regard to a play or novel, beyond that of the derivation of the characters—that of the unity of underlying intention to which each character contributes. Is there anything in the dream corresponding to such an intention? Mr. Thorburn believes that there is—that upon a careful scrutiny of the dream, with its associated material, there does emerge—at any rate in some cases—"an integral relation to each other" of its parts or scenes. (p. 14) He struggles to find satisfactory expression for the relation which he feels exists between the ideas of waking life and such unity of motif as appears in the dream, and ends with the tentative conclusion "that to the unity discoverable in an attitude of conscious reflection and deliberate plan, there can be found a correlate in the unity which appears in the dream, and finds expression in the characters of the dream." (p. 16) On the other side of the analogy he expresses the relation between the unity of the poem and the conscious idea with which the poet may begin his work, by saying that the idea must, as idea, perish, but its nature will remain recognizable "even after its absorption into the action and by the characters which it brings to birth." (p. 30)

I will now examine some examples, to see how far these statements are borne out.

While my mind was occupied with the questions to be considered in this article and with their application in my experience, I had the following dream. I was standing in the bedroom that I occupied as a child, looking down into the street. There a crowd of people seemed to be reveling, burning flaring lights in the semi-darkness and making noise with drums and pipes. My window was open and I wished to shut it, being afraid of the tumult of the crowd, afraid also to be seen shutting the window—at the same time half fascinated. As I watched, the crowd parted to leave space for a figure that danced wildly, a figure shaggy.

half child, half animal. While I gazed, the room in which I stood changed. It was now a class room full of students writing at desks. I seemed to be in charge, as at a college examination. The beat of the wild dance was still audible, and at the sound the students rose from their desks and began themselves to dance. I felt this was but natural, yet in pursuance of my responsibilities, appealed to them, urging that they were making confusion and could not do justice to their dancing in this room equipped for study. Almost to my surprise they responded, and laughing goodhumouredly sat down again to their writing.

Waking in the night, with the dream vivid in my mind, I at once dwelt on its parts for their associations. The scene from the bedroom window recalled various childish memories, but especially those connected with the celebrations of the fifth of November—Guy Fawkes day. I recalled how excited I used to be, so that I could not sleep for eagerness at the thought of the grotesque figures in masks and paper tatters that would appear in the streets the next morning. In the evening we children put on masks and paper trappings and ran about the house; and out of doors, later, there might be torchlight processions, and we would hear rumours of rowdy burnings of unpopular townsfolk in effigy. The mingled fear and fascination that a timid child felt at all this was reproduced in the dream, but the music and the dancing figure were not wholly acounted for by these memories. The dancing of satyrs was suggested, and as such literary associations arose, together with the childish memories, I realizedwhat I had not thought of while reading anthropological discussions of May day, or other survivals of ancient rites -that these November celebrations also must have had in them something of the fascination of ancient Dionysian revels. The masks and other disguise, the temporary defiance of accustomed order, must have appealed to some

energy in the mind such as once helped to create the figure of the Greek nature god, and his attendant satyrs. Or so I interpreted the meaning of the condensation in the dream figure. The second scene of the dream recalled memories of sitting in college class rooms, supervising examinations in June, when intoxicating airs came in from sun-steeped fields. The dream seemed like a review of life from childhood through maturity, with the scenes strung, as it were, on one thread-that of the timid or qualified response to the appeal of nature forces. As I dwelt on the later part of the dream in relation to more recent experience, the laughing return to their work on the part of the students who had felt the rhythm of the dance, suggested a hopeful interpretation of the dream, as though the unconscious product were in harmony with the conscious desire to bring even into literary work more of the pulse of life. I would not, however, attempt to argue from that interpretation. I would use the dream only as an illustration of the bringing together, in the form of dramatic action, of bodies of experience which might also be linked by a reflective idea.

In an article in *The Monist*, October, 1921, Mr. Thorburn has spoken of the peculiarly aesthetic effect upon the dreamer of a dream of which he seems to see the interpretation. The sensuous emotional quality of the images, together with the far reaching relationships they bear, may produce, though for him alone, a true aesthetic impression. The images are crudely juxtaposed; their significance for another mind hearing the supposed interpretation is still largely external, not wrought into their texture, as it would be in a true work of art. Only for the dreamer himself do the associations, once realised, seem to inhere in the images. In the dream I am now considering, there seemed to me "an integral relation" of its scenes to each other. The figure of the daemonic dancer, whose wild dancing could daunt

and fascinate the timid child, could draw students from their books and perhaps infuse a new spirit of laughter into the work they resumed, seemed to be presenting, in a spontaneously formed image, a force which reflection could recognise as a common element in actual experiences—the force of the untamed life without the individual that calls to the instinctive energies within, to meet which, with the right adjustment, is a life's problem. One could assert a correlation between the unity of the dream and the unity in the dreamer's conscious outlook.

Is it possible to compare such a dream with a play or poem, to see whether we could thus bring out more clearly the likeness and difference which it is suggested may obtain between dream and work of art? One feels a certain absurdity in attempting such a comparison, but may suffer that for the sake of securing more definite embodiment for an hypothesis which is hard to judge when no illustrative material is distinct in the minds of the writer and reader.

I will take as example the mythological theme of Faust, as it appears in the play by Marlowe, and again in the earliest version of Goethe's drama. The poetry that embodies myth seems to give the most obvious starting point for the comparison between poetry and dream. The mythical figure of Faust, or of Mephistopheles, invites us, as an apparently realistic figure does not, to seek in it embodiment of half-conscious cravings, such as we think we recognise in the denizens of a dream.

Of the original legend of Faust—of which the several prose versions were so eagerly received in Germany during the years between 1587 and 1599—J. A. Symonds writes: "No epic of the Middle Ages condenses within shorter compass the spirit, sentiment and science of that period," with its "desperate revolt against intolerable mental bondage, the grotesque hysterical amusements as of some paralytic but gigantic infant, and the inordinate desire to penetrate

forbidden secrets." Marlowe in his play of Dr. Faustus filled the tragic figure of the German tale "with the intensity of life belonging to himself and to the age of adolescent vigour." "Faustus had in him the passion of that spirit which discovered America, which circumnavigated the globe, which revealed the planetary system, which overthrew the tyranny of Rome." The men of the time of Marlowe's play, "hailed Faustus as a hero, but they acquiesced in his doom." "The world-old identification of man's thirst for power and knowledge with rebellion still oppressed their spirits." I quote these passages because they illustrate the way in which a figure in a play may be felt to embody forces discernible in the vital attitude and outlook both of the individual poet and of the men of his age.

In the early version of Goethe's "Faust" the same theme similarly reflects through its different treatment the attitude of the poet and of his time. Goethe's Faust, unlike Marlowe's, has little religious faith or fear. In place of faith are a romantic regret and yearning for something beautiful and lost. Into the revolt from the dusty abstractions of mediaeval learning and longing for fuller life Goethe imports new meanings—a new romantic yearning toward the wild aspects of nature, a new sense of the mysteries of cosmic law into which, through magic, Faust hopes to penetrate.

With these examples and comments in mind, let us take up the analogy between the poetic drama and the dream, and consider the "psychological path" between the poet's experience and the work of art. Goethe has told us something of how, for a time in his youth, he lived with the symbol of the Faust legend, as he had met it in chapbooks and on the stage of the marionette theatre. "The puppet play echoed and vibrated in many tones through my mind.

<sup>\*</sup>A. Symonds, Shakespeare's Predecessors pp. 503-4, 505fi 508 and 509, respectively.

\*Wakrheit und Dichtung.

I, also, had gone from one branch of knowledge to another. and was early enough convinced of the vanity of all. I had tried life in many forms, and the experience had left me only the more unsatisfied. I now carried these thoughts about with me and indulged myself in them in lonely hours but without committing anything to writing." Here there is no reflective idea as the apparent starting point of the work, but rather a fascinated brooding on the theme, so that the imaginative and emotional life of the poet becomes gradually absorbed into it. So far as such a process can be regarded as the essential one in poetic creation we have an analogy with the dream. In the dream—or rather, should we say, in those dreams which the dreamer finds significant, his emotional life seems to have been unconsciously absorbed into certain images, which, thus charged with energy, have worked within him and fallen into patterns that reveal, if he can interpret them, something of the underground currents of his being. Similarly it would seem in poems such as the Faust dramas, by a process independent of conscious purpose, there is poured into the theme that fascinates the poet something of "the secret treasure of the heart," accumulated by many interactions with the manifold life of his time. It is thus that poetry becomes a record from which succeeding generations may draw, as Shelley says, all "which their peculiar relations enable them to share—more than could become conscious to the poet himself or the men of his day."

Moreover in the patterns found in dreams and in the themes which fascinate the poet we find recurrent situations presenting a certain correspondence. The disturbing influence of the daemonic dancer in the dream described, shows a distant resemblance to certain aspects of the figure tempting Faust in the legend. One could not make much of this analogy in the examples before us. The figure of Mephistopheles, both in Marlowe's play and still more in

the work of Goethe, is fashioned in relation to the character of Faust by so many subtle determinants that the general character he may have in common with simple variants of a nature god is of little interest. Yet this hypothesis of archetypal forms recurring in dream and work of art has been felt to have value, and seems worth examining in a wider range of material. Dr. Jung has urged that wherever creative phantasy is freely manifested, we find the primordial image or archetype, a mythological figure or situation characterized by peculiar emotional intensity, corresponding to some inherited "resultant of countless typical experiences of our ancestors."10 The poet shapes the archetypal image in a form fitted to the needs of the time, so that men may be stirred by it afresh. In each of the great poems of Marlowe and of Goethe we are made to feel anew, in terms of a distinctive outlook upon life, the thrill of the archetypal situation in which an accustomed, and, as it were, hallowed order of existence is challenged by a force untamed, outlawed, infinitely alluring. The archaic reminiscence in the dream image has no such power to stir men's hearts, yet, as it comes home to the dreamer through the massed intimate associations of his own life, the strangeness amid the intimacy may give it a special significance for him, comparable to that which the genius of the poet can cause the whole community to feel within his theme.

The character of art as embodying archetypal images is considered by Mr. Thorburn in his chapter on Imagination. He makes clear at this point his judgment of the inadequacy of Freud's view as compared with that of Jung. "The attitude towards the archaic becomes", he says, "the touchstone separating the various schools of psychology. It is a question of the plasticity of the inherited psychical

<sup>&</sup>lt;sup>10</sup>"On the Relation of Analytical Psychology to Poetic Art", British Journal of Medical Psychology, Vol. III, Part III, p. 229.

material." (p. 73). Ultimate problems of value, in relation both to art and to religion, are connected with this question. If, with Jung, we believe that the archaic images appear in dream and phantasy with a prospective significance, undergoing transformation in accordance with urgencies of the inner life of the moment, then there is opportunity for conscious purpose to ally itself with all there may be of promise in these unconscious products. Whether to be used for the ends of art or of practical life, they are means of access to a reservoir of power. To those holding this view the interaction of conscious and unconscious throughout the sphere of art becomes a problem of great significance and they have a clue with which to approach it.

At this point I will take up again the question of the relation of conscious and unconscious factors within that preliminary work of the poet which Mr. Thorburn calls "selective meditation." I referred to the young Goethe's musing upon the Faust legend, as a process in which the unconscious energies of his mind were passing into the images of the tale, with little exercise of conscious insight and reflection. But one is clearly not justified in taking this absence of reflection as typical.11 Mr. Thorburn, in his discussion, selects as typical the case where the literary artist begins his meditation upon a play or novel with some reflective idea in mind, for which he tries to find expression. The reflective idea, he says, must, as idea, perish, as the

<sup>&</sup>lt;sup>11</sup>Goethe's later method was very different. Compare the passage in the posthumously published *Abschied*, where he contrasts his later clarity of mind with the confused emotions which he expressed in his earlier work upon Faust, when he was "stirred by the pressure of human tumult" and "by the power of management."

Am Ende bin ich nun des Trauerspieles Am Ende bin ich nun des Trauerspieles
Das ich zuletzt mit Bangigkeit vollführt,
Nicht mehr vom Drange menschlichen Gewühles,
Nicht von der Macht der Dunkelheit gerührt.
Wer schildert gern den Wirrwarr des Gefühles
Wenn ihn der Weg zur Klarheit aufgeführt?
Quoted in Croce's Study of Goethe, translated by Ainslie, 1923, p. 82.

characters and the action develop. Yet in some way it remains, giving unity to the completed work. He refers in a note to an interesting passage12 in which Mr. Bullough discusses the statement made to him by a well-known dramatist as to his method of creation: the idea with which he starts "condenses itself into a situation made up of the interplay of certain characters" which develop in great independence of the author's conscious direction. Mr. Bullough remarks: "The paradox of just the germ part of the whole [i. e. the initial idea] being doomed particularly impressed my informant, as a kind of life-tragedy." Mr. Bullough regards the idea as 'the man's'; "it is the reflection of the dramatist's concrete and practical self." The 'characters', on the other hand, are 'the artist's': "they belong to the imaginary world." "As elsewhere, the distancing means the separation of personal affections, whether idea or complex experience, from the concrete personality of the experiencer, its filtering by the extrusion of its personal aspects, the throwing out of gear of its personal potency and significance."

For the purpose of examining these statements I will take, as illustration, Ibsen's play, "The Enemy of the People," which, with others, has been fully discussed by H. Weigand, in his book, The Modern Ibsen. Mr. Weigand shows that Ibsen began his play with an idea, or group of ideas, that was—in Mr. Bullough's phrase—"a reflection of his concrete and practical self", a group of moral and political ideas that were for Ibsen full of the urgency of pent-up indignation. We find in Ibsen's earlier letters formulations of the 'discoveries' which Dr. Stockman makes in the course of the play's action, such as that "the minority is always in the right," and "the man who stands alone is strongest." Some months after the play was

<sup>&</sup>lt;sup>12</sup>Bullough, "Distance as an Aesthetic Principle," British Journal of Psychology, Vol. V, part 2, pp. 115-116.

finished, Ibsen wrote of Dr. Stockman in terms that showed how closely he associated himself with his hero. He spoke of himself as, like Dr. Stockman, a "fighter in the intellectual vanguard at least ten years ahead of the majority." "Dr. Stockman and I," he wrote to his publisher, when sending him the MSS, "got on excellently together, we agree on so many subjects. But the doctor is a more muddle-headed person than I am. . . . " Mr. Weigand, in his study of the play, has brought out something of what was involved in Ibsen's recognition of the muddle-headedness of Dr. Stockman—a recognition that seems related to the 'distancing' of which Mr. Bullough speaks. For, nearly as the views of Ibsen's hero corresponded with his own, yet the absurd and even anti-social aspects of the Doctor's enthusiasm for truth are brought out plainly enough in the development of the character in its setting in the play. "The psychologist in Ibsen", Mr. Weigand suggests, committed 'sabotage' against the creation of the 'irate reformer,' "sawing through the props on which the fine ethical facade of the doctor's indignation was built," (p. 120); and again, he speaks of the way in which Ibsen's characters when they began to live in his mind developed beyond the limits of the original idea: "the poet assumed more and more the role of an observer." (p. 75)

The question that suggests itself to me, when comparing this play of Ibsen's, or other plays, with earlier expressions by the author of his original idea, is as to how far we are right in thinking of the idea thus formulated as 'the germ part' of the whole, or as 'bringing to birth' the characters and action. Is not the idea that perishes merely one form of expression thrown off at a particular moment

<sup>&</sup>lt;sup>13</sup>Mr. Thorburn gives an interesting illustration of the absorption of the idea of conscious reflection into the imagery of the work of art, from Dostoievsky's novel: *The Brothers Karamasov*. I have preferred to use an illustration from Ibsen in which I seem able to follow more clearly the transformation by the poet of the personal idea: but I think the general criticism would apply equally to Mr. Thorburn's example.

in the growth of something deeper and more vital, which is truly the germ part and which does not perish but finds fulfilment in the completed work? In a discussion by Vernon Blake14 of the process of artistic creation, with special reference to sculpture, the term 'thought' or 'idea' is used for the artist's guiding intention, which may not be expressible in words, but only in the chosen medium. Even when, as in the case of the dramatist, the medium is language, in the special form of speech by which persons interact in particular situations, it seems equally true that the artist's real intention may not be expressible even to himself in other terms than in his chosen medium. Graham Wallas quotes, as illustrating the dependence of the poet upon his medium, the delightful and pregnant saving of a child: "How can I know what I think till I see what I say?"15 Ibsen, as irate reformer, did not know what, as poet, he thought, till he saw the muddle-headed Dr. Stockman saying the things he had himself said, but in the manner and in the particular settings which the poet's art shaped. Then Ibsen began to know so much of his own secret thought that he set out upon the writing of the Wild Duck, perhaps as severe an act of self-criticism as poet ever achieved: and on the eve of the publication of this play he quoted, Weigand states, the verse in which he had formulated something of the sense of his task, and which Weigand translates:-

To live is to war with fiends [better 'trolls'—trolde]

That infest the brain and the heart;

To write is to summon oneself,

And play the judge's part.

I have dealt with this point at some length because it seems to me to open the way to large issues as to what we are to regard as conscious and what as unconscious factors in art and in reflection. It is natural to say that we are con-

<sup>14</sup>Relation in Art, Oxford University Press, 1925.

<sup>15</sup>Graham Wallas, The Art of Thought, Jonathan Cape, p. 106.

scious of our ideas, but surely no one has tried to give an account of an idea by which he lives and works without becoming aware of some sort of cleft between that inner reality and the formulation of it which, by the help of words, he throws on the screen of consciousness, as an object for himself and others. The idea which we formulate seems but an approximation to that vital idea that works 'behind the eyes' as a shaping principle in thought and action. When no such cleft is felt it is perhaps because some form of words has become so sanctified by social custom, or so identified with self-feeling, that its firm front quite obscures the sense of vital changes that may go on behind it. It is when this happens that what we find ourselves saying ceases to help us know what we genuinely think. Thought and speech alike settle down to be that 'ordinary conscious thinking' which Professor Prescott in his book seems to regard as the norm of thought, and describes as quite voluntary—"we think both when and as we will" (p. 39)—but "shallow," as compared with the dreaming thought of the poet (p. 90). No creative thought, whether it issue in poem or scientific discovery, in practical achievement or philosopher's vision, is conscious and voluntary in this sense. Always it must depend upon the operation of mental systems of whose growth and potentialities we can know little. Habitual sequences of verbal thought we can of course initiate, knowing how they will unfold, and we may set ourselves to work out mechanical problems with such habitual trains as units, contenting ourselves with manipulating the worn counters of thought and speech. But creative thought is not of that nature. It requires the directive interaction of what has been integrated as conscious form and recognised purpose with what emerges, still unformed, from the dark of unconsciousness. The self integrated through voluntary effort, with its shaping principles of action, can never become completely an object

of consciousness; still less, the wider self, with its unformed resources, upon whose co-operation the fulfillment of pur-

pose may have to wait in creative thinking.

The failure to recognise this character of complete thinking vitiates much of Professor Prescott's discussion. He seems to me to over-value the undirected associative type of thought akin to dreaming, and to identify it with the poet's thought too readily, because he usually contrasts with it only the mechanical kind of thinking with familiar verbal counters. Mr. Thorburn has a fuller sense of what is involved in true thinking. Part of the motive of his whole discussion of art is the belief that, without the study of the vital thinking of the artist, the philosopher can never come to understand the thought whose nature has been his special problem—the thought that aims at objective truth and knowledge. (cf. p. 98)

If we recognise the thought that aims at scientific or philosophic truth as creative, and as requiring interaction between conscious and unconscious factors, as does the thought of the artist that aims at beauty, how shall we distinguish between them? How mark off the distinctive character of the thought of the poet? Mr. Thorburn seems to me to follow the right clue when he lays stress upon the artist's medium. The artist is distinguished from all dreamers and thinkers who are not artists by his command over the particular medium in which his thoughts and dreams find expression.

The passage in which Mr. Thorburn introduces the reference to the medium, as the clue to the distinctive character of art, is one of particular interest. In it he presents an intuition in that first dim but arresting form when it clothes itself naturally in the language of metaphor. The

<sup>&</sup>lt;sup>16</sup>Compare the admirable discussion of the interaction of conscious and unconscious factors in the complete process of thinking, in Graham Wallas' book, *The Art of Thought*.

artist's medium, it is said, keeps him in a sense asleep and dreaming, though with eyes open and hands active. "It is. somehow, the contact of the artist with the earth—with the sort of dark, earthly, earthy things that have never awakened and that infect him with the power of their slumbers." (p. 38) The clay, with its "cool, moist, earthy feel" is taken as a type of the primitive medium that shows that character most clearly. But what of the medium of the poet? With what dark, earthy, unawakened thing is he in contact, that, through it, his dreams may gain substantial being? Mr. Thorburn suggests an answer to this question through a consideration of the nature of drama. Here the group of actors are part of the medium of the poet. The play is written to be expressed through the speech and action, and the whole emotional personality, of living men and women. The actors are themselves artists, co-operating with the dramatist, using their bodies as the medium of art. We are led back in thought to the dance, in which drama originated, and which is one of the oldest forms of art, if not, as might be urged, the most primitive of all. Mr. Thorburn here makes the recognition of the human body as equal with the clay, "in its claim to typify the material medium through which alone art is possible." (p. 93)

Is it then in the human body and its natural powers that there lies the earthy enchantment that fascinates the poet and, holding him entranced, makes him able to tell more of the secret treasure of his heart than his conscious mind knew? It seems to me that there is something of psychological truth in the intuition thus fancifully expressed in regard to the poet's art. We speak of the poet's medium consisting in words, but words used in a special manner, according to deeply rooted understandings between the poet and those who enjoy his work. If we consider, for instance, the acted play, as the completest type of literary art, the words there spoken are charged many

times over with the rhythms of the body. Each speech obeys a rhythm characteristic of a particular personalitya personality created first from the resources of the body and mind of the poet, then, sympathetically, from those of the actor. Also, each speech has its place in a sequence of presented action so planned that the emotional significance of every part is heightened by the rest—a sequence of action moreover that may hold within it, as was illustrated in the Faust dramas, the instinctive urgencies of the life of an age. As the absorbed spectator, or participant, of a ritual dance feels his own body and spirit caught up into its rhythm, and thus knows communion with his group, so the spectator watching the close of a great play is transported into a visionary whole that vibrates around the momentary utterance and action upon the stage—a whole, spiritual and sensuous, the product of an interaction of many lives, present and remote. Nietzsche has described Greek tragedy as, fundamentally, a Dionysian dance that generates a vision—an Apollonian world of pictures; and through other literary forms one can trace something of the same character. When differentiation of a literary species has carried it far from the original bodily participation in song and dance, still, within the subconsciousness of the poet and of the sympathetic reader, there will persist sensuous reminiscence: the language is swaved, as it were, to the rhythms of the poet's mood, and with the changing stresses of the vision that unfolds.

It is hard to avoid vagueness in surveying, with reference to a single elusive idea, the whole field of literary art. In detailed studies of different literary forms I have found confirmation of this idea I am trying to express, of the sensuous reminiscences of complex activities of body and mind that haunt and enrich the language of the poet—reminiscences pertaining not only to the life represented, but to the language forms themselves. Thus, when Mrs.

Campbell<sup>17</sup> tries to express her sense of the distinctive form of Shelley's lyrics, the images of widening circles, soaring spirals, dominate her description. Is it not true that one cannot read with absorbed attention *The Ode to the West Wind*, without some sense of participating in its wonderful rhythms as in the movement of an unearthly dance? Or again, in Mr. Lubbock's<sup>18</sup> study of form in the novel, he is compelled to seek in terms of movement an expression of the characteristics he is trying to distinguish. He speaks of the marshalling and concentrating of the procession of figures that passes across our line of sight. One is again reminded of the ordered evolutions of a dance, or pageant.

Certainly this is only one aspect of the literary artist's relation to his medium, but the consideration of it perhaps helps us to realise how deeply the perfecting of that relation must influence the whole process of artistic expression. When the artist has found and mastered his right medium, then, as we seemed to find in the case of Ibsen, subtle truths latent in his experience may pass into expression through the channels of that medium, which could not otherwise come to consciousness at all. Thus, Professor Bradley19 suggests that we have no reason to suppose that, if we could know the opinions and beliefs held by Shakespeare, as a man, we should find their value extraordinary. Shakespeare's imagination "all his experience and thought was latent, and this, dwelling and working on the stories. with nothing but a dramatic purpose, and kindling into heat and motion, gradually discovered or created in them a meaning and a mass of truth about life, which was brought to birth by the process of composition, but never preceded it in the shape of ideas, and probably never, even after it, took that shape in the poet's mind."

<sup>&</sup>lt;sup>17</sup>Olwen Ward Campbell, Shelley and the Unromantics.
<sup>18</sup>Percy Lubbock, The Craft of Fiction, 1921.
<sup>19</sup>A. C. Bradley, Oxford Lectures on Poetry, pp. 172-3.

Professor Bradley's reference to the state of the poet's mind when his poem has been written brings us to the final question with which this discussion is to deal—that of the relation between the creative and the reflective processes, as this relation appears in regard to literature.

Something of the process of literary creation we have tried to show is akin to the process of the dream. In both is something of the same urge, older and deeper than reflective thought or will, toward expression of the inner life in shapes palpable to sense; something of the same unconscious merging of the products of individual experience with those of the experience of the race. But, also, there is much in the process of literary creation that is akin to reflective thought, as carried on in those minds that find their true medium in the language of the understanding rather than in that of the emotions. The poet is in some measure necessarily the critic of his own work. The vital idea that passes in almost dream-like fashion, into expression through the poet's rapport with his medium, must be at least partially discerned and understood by him, that he may perfect its expression. In cases where we are able to compare the first draft of a play or poem with the completed form, we have some opportunity to estimate what the poet, as critic, has accomplished. In the study already referred to that Mr. Weigand has made of Ibsen's plays. the available first drafts have been closely compared with the later form. Ibsen spoke of his work upon his rough draft as consisting largely in the further "individualization of the persons and their mode of expression."20 have meant, in part, a sort of spontaneous growth of the characters, the poet, assuming, as Weigand puts it, "the role of an observer." But it must also have meant purposeful critical labour, in the seeking for the best word, or detail of action, rejecting that which first appeared, in the

<sup>20</sup> Letter to Caspari, June, 1884.

contriving of links and welding together of parts, that the whole might fulfil that underlying intention which was gradually working itself clear.

This critical labour, incidental to the work of creation, need not involve much of that further effort of critical thought that goes behind the art product, seeking to discern something of the forces that went to its making, and of its relations within the history of culture. The poet may be himself capable of criticism in this sense. He may possess a twofold gift and feel the urge not only to create but to understand creation. Not at the moment when his ideas take sensuous shape, but at other moments and in a different attitude of mind, he may set himself the task of expressing in philosophic language the nature and relations of his own work as poet. A certain incompatibility there seems to be between the two attitudes or capacities, so that they are more often found as the gift of different men; yet they have a good deal in common. The philosophic critic who has not the gift of poetic creation yet knows, since language is his medium also, the joy of the discovery of the right word or phrase, that suddenly enriches his individual meaning with the racial experience, the triumphant recognitions, that have fashioned the word, and remain potent within it. He knows also the joy of finding, as he explores his subject matter, the illustration that with its sensuous vividness will serve to hold firmly together several strands of meaning, and so contribute to the growing pattern in the web of his discourse. Such adventures in interaction between mind and medium give him a sense of kinship with the poet. Thus, it is partly equipped by the experience his own craft affords him that the philosophic critic approaches the study of literature. Also, he should, of course, approach it with trained receptive sensibility.

Our initial question was as to whether the study of

the unconscious with the help of the new methods could contribute anything of value to the literary critic. I have tried to show how, in the work of art, we find meanings lifted from the welter of unconscious experience, displayed, in terms of a sensuous medium, as objects for social contemplation. The task of the philosophic critic involves a further detachment of meaning, from the particular medium, and from the conventions that govern at any particular period the process of expression in that medium. It is by the abstraction and consolidation of such meanings, or ideas that, as Mr. Thorburn urges, (p. 195) a higher degree of understanding can be established between one appreciative mind and another, and between the art-consciousness of different ages. We can appreciate the Faust and Mephistopheles of Marlowe's or of Goethe's poem more fully, and can enter the better into the appreciative attitude of the men of the time, the more we have attained reflective ideas concerning the forces within the human mind that these figures symbolize, and the ways in which they find expression in the literary medium. For the attainment of such ideas we need a fuller study of works of art in comparison with dream and myth, religious symbol and philosophic system—with all forms in which the creative energies of the mind find expression. It is as a contribution toward such study that I welcome the sincere and individual thought in the book by Mr. Thorburn that I have considered in this article

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LONDON, ENGLAND.

## REPORTS AND NEWS

## THE INTERNATIONAL CONGRESS OF PSYCHOLOGY AT GRONINGEN<sup>1</sup>

The Eighth International Congress of Psychology was of such importance, and the papers there given were so numerous, that in reviewing them, it seems preferable that after grouping them conveniently, we tarry only with those that offer a particular theoretical interest, and then present, from our personal point of view, a critical statement, in order more easily to make evident the fundamental conceptions upon which they rest.

Among the most interesting papers, those of E. G. Boring of Harvard University, Ch. S. Meyers of London, and H. Werner of Hamburg, form a group on the intensity of sensations, more especially concerning the question of whether intensity should be considered as a quality or as a quantity. The paper by Kiesow, University of Turin, Ueber das Weber'sche Gesetz, also belongs to this group. The question of the intensity of sensations is allied, in fact, to Weber's celebrated law, the clarity of which has rather suffered from than profited by the mathematical formulation to which it has been subjected.

It is well known, and Kiesow has brought it up again very opportunely, that this law in substance states simply that, corresponding to the least perceptible differences in intensity or extent between given sensations or objects, there is always the same relation between the strength of the stimuli to which these just noticeable differences in intensity or extent are due. Thus nothing is more exact than the observation of Fullerton and Cattell who point out that this law expresses, not a relation between stimulus and sensation, but a relation between the strength of the stimulus and the size of the error of observation which the observer is likely to make, the size of the error being proportional to the strength of the stimulus.

However that may be, this law of Weber's does not at all help us to understand of just what this *intensity* of sensation consists, because, as Kiesow and Werner have pointed out, we apply this term *intensity* to the mental fact and not to the underlying nervous physiological process which is justly what it behooves us to know. And the question of knowing in what *intensity* of sensation consists raises the question also of knowing in what the quality itself consists. Otherwise expressed, what is it, from a physiological point of view, that corresponds to what we call, from a psychological point of view, the *intensity* and quality of our sensations? (Concerning the olfactory sensations, Juhasz, of Budapest, distinguishes, in his paper entitled Zur Grundle-

<sup>&</sup>lt;sup>1</sup>Translated from the French by E. L. Clark.

gung der Geruchspsychologie, between their quality and their height Geruchshoehe.)

According to Boring the quality of sensations can depend neither on the specificity of the nervous conductors nor on the single fact of the localization of the central terminations of these nerves at one point rather than another in the cerebral cortex. "It seems that all these nerves are alike and are only passive conductors. If we continue to speak of their specific energies we have in mind only a local specificity of their central terminations. But this concept of quality is nevertheless in opposition to the theory of localization. It is difficult to believe, for example, that the difference between red and blue is only a difference in localization in the cerebral cortex, when some differences in localization have already been admitted for explaining the physiological substratum of the order in which the sensorial elements are disposed in space." Thus would Boring be inclined to hold to the theories of frequency, which attribute the several qualities of the several sensations to the respective frequencies with which, in the course of the sensations themselves, the unique physiological phenomenon which is at their basis is repeated, theories manifestly suggested by the fact that to different colors and to different pitches of musical tones there corresponds a single physical stimulus, but one which repeats itself at a varying frequency, each different quality of sensation corresponding to a different frequency. As to the intensity of the sensations, the principle of "all-or-none", adds Boring, "seems to render it improbable that the nervous fibres can transmit different degrees of excitation;" therefore he is inclined to think "that when the quality is a function of the nervous frequency, the intensity depends upon the number of fibres stimulated." This latter hypothesis seems contradicted by the experiments of Kiesow showing that "a single tactile fibre on the cutaneous surface is capable, even when entirely isolated, of discerning differences in intensity."

What opposes this theory of frequency is, first, the fact that we discriminate very well, among a large number of physiological phenomena which occur in our organism, the frequency of repetition, that is to say, the frequency pure and simple, more or less rapid, without confusing it with a change in quality. But especially in opposition is the other fact that with this theory one can not understand in what fashion these different physiological frequences can "pile up" in the respective nervous centers in order later to be reproduced at the time of the mnemonic calling up of these specific elementary sensations.

Instead of this theory of frequency may be advanced another hypothesis which supposes that to a different duration of each of the elements of two different physical stimuli (for instance, to a different duration of each one of the semi-vibrations of two rays of light of different color) there corresponds a different "energetic capacity" of the respective elementary physiological activities, provoked by the two stimuli; i. e., a different "energetic capacity" of the elements of the two corresponding nervous currents, to whose elements by analogy to the electrons, we have given the name "nervions". (It is enough only to recall the fact, analogous to the one with which we are here concerned, that other things being equal, a low note, precisely because of

its longer corration, displaces during each of its semi-vibrations a larger volume of air, that is to say, a mass of air of a more considerable energetic capacity, than that displaced by a higher note).

In other words, to different qualities of our sensations, red, green, etc., (mental phenomena) would correspond different energetic capacities of the "nervions" of the respective nerve currents (physiological phenomena). Whereas the electrons of the electric currents have all the same energetic capacity, the nervions, on the other hand, would have different energetic capacities in specifically different nerve currents. Those who know our works on biological synthesis (Biological Memory, What is Life?) know that this hypothesis of nervions has made it possible for us also to explain the reciprocally univocal relation which exists between the specificity of a nerve current (to which corresponds in the mental realm the specific sensorial quality) and the specificity of the nuclear substance in which the nerve current comes to accumulate at the time of its passage from the actual energetic state to the potential energetic state; and they know also that this hypothesis has furnished us the explanation of the fundamental mnemonic character of nervous energy, which nervous energy we have put at the base of all life.

We should have here also an explanation of the *localization* of specific sensations; that is to say, of the fact that the seats of the accumulations of identical or closely related sensations come to be grouped at the same point in the cerebral cortex. Each kind of "nervions", in fact each specific nerve current, should accumulate where, thanks to the presence of other identical or closely related "nervions" which have accumulated there earlier, it finds the most favorable nutritive conditions for the subsequent accumulation of the respective "nervions", in addition to those preceding.

We can, in turn, accept the hypothesis, accepted also by Boring, that the differences in intensity of a single specific sensation "depend upon the number of fibres stimulated." We are entirely inclined to accept this hypothesis, because the sensorial intensity (mental phenomenon ) should then become "the conscious correlated fact of this number of stimulated nervous fibres," that is to say, the conscious correlative fact of "different extents or spatial distributions of multiple excitations," which should stamp on this intensity, in addition to its quantitative character, a qualitative character. This would conform to the demand of Semon who wishes to distinguish between the intensity and the vividness of sensations (or of sensorial memories). The intensity, according to him, is a qualitative aspect and vividness a purely quantitative aspect. Semon says, for example, that one can have a very weak evocation-i. e., one of insignificant vividness-of a thunderbolt which at an earlier time struck our ears: feeble sensorial evocation leaving intact the quality of the strong intensity of the thunder itself; and, on the other hand, we can have a very vivid sensation or arousal of a scarcely perceptible noise of a step which we heard in the night in our bedroom.

If, to the hypothesis that intensity depends upon the number of excited fibres (an hypothesis by which one gives a certain qualitative aspect to intensity) is added the theory that vividness in the sense that Semon uses the word, depends, on the contrary, upon the number of elementary units, or "nervions", which unload or pass during a given time in a single given fibre, one then succeeds in identifying the physiological substratum which can

correspond to the psychological phenomenon of vividness. One succeeds also, by this hypothesis, in refuting the objection which Kiesow, as we have said, had formulated on the basis of his experiments which show that even a single tactile nerve fibre is capable of transmitting differences in intensity. In fact, one may suppose that in this case it is a matter not of intensity, properly speaking, but only of vividness.

The questions raised by the so-called "theory of configuration" (Gestalt theory) belong in certain respects to these problems relative to quality, intensity, and sensorial vividness, especially as regards the "mechanism of both theories have recourse, the one in order to give integration" to which place to the "conscious correlative fact of the number of fibres stimulated" which alone gives to the intensity of a sensation a qualitative character, and the other in order to give place to the conscious perception of the configuration as a group of sensorial elements.

The founders of this theory of configuration are, as is well known, the German scholars Wertheimer, Koffka, and Koehler. They all three attended this Congress which we are discussing, and about them are grouped writers of papers having to do more or less directly with the principal question—Michotte of the University of Louvain, Spearman of London, Otto Sclz of Mannheim, Usnadze of Tiflis, Auguste Ley of Uccle, Werner, already mentioned, Reymert of Springfield (Ohio) and others

As we know, according to the configurationists, sensorial elements by themselves are not enough—as is asserted by the associationists of the English school—to account for the perception of the whole, that is, of the object as a unity. They maintain that it is impossible that the form of an object, such as it appears to our eyes, represents only a mosaic of particular sensations accidentally associated with one other; and they assert that, in order that this chaos of sensations be transformed into a configuration, the intervention of an "integrative mechanism" is necessary. They go even farther and postulate that it is this configuration which constitutes the immediate psychological datum, the primary mental fact, the fundamental quid of perception and even of comprehension. The configurationists, said Spearman in his paper on Two Defects in the Theory of "Gestalt", "expressly set out to overturn the view which splits up sensory perception into an ultimate set of sensations."

Against this theory of configuration, today very popular in Germany, we place, in so far as it concerns us, the theory of affective integration and of affective meaning, according to which it is the affective tendencies that give a unity and a meaning to each bundle or mass of sensorial elements which strike our retina or our senses in general. That is, when this or that bundle of sensorial elements succeeds in arousing, in "loosening", a certain affective tendency, one immediately obtains the synthesis, the reduction to unity, the meaning of the sensorial bundle itself, which then, and only then, appears to us as such and such object, as such and such configuration. But a discussion of this subject would lead us too far afield and take too much space; besides we plan to take it up again in an article which we shall publish soon.

Closely related to the phenomena of vividness,, which, as we saw above,

are the phenomena of *intensity*, are others which approximate hallucinations and are named *eidetics*. These phenomena, as we know, have been very carefully studied by Jaensch of Marburg, who at this Congress presented a new paper on the subject. This subject was also treated by Kiesow in his paper *Zur Kritik der Eidetik*, by Gatti of Milan, and by Soola of Berlin.

According to Jaensch, these phenomena, which are in nature close to hallucinations, constitute a phase of the normal development of each individual in the course of his childhood; whereas Kiesow contests the ontogenetic character, so to speak, of these eidetic phenomena and considers them as abnormal, pathological phenomena.

But in his paper before the Congress, entitled Die typologische Forschungsmethode mit besonderer Berucksichtigung der Eidetik, Jaensch was determined more especially to make evident that these eidetic phenomena, by means of which the individual literally "sees" what is represented to him by his imagination, lend themselves to typological investigation in so far as they are pecular to the "integrative" type; that is to say, to the type presenting a "reciprocal penetration of functions", as much bodily as mental, which, with the normal individual, are in general clearly distinct and separate from each other. The type of artist who "lives" his world of images is the most familiar example in point.

While recognizing the great value of these studies of Jaensch, we must nevertheless note that he does not make sufficiently evident the very marked affectivity and emotionality of these eidetic subjects, to which precisely the mnemonic rearousals owe their great "vividness", which brings them so close to hallucinations, this great vividness being due to the reënforcement (that is, to what Sherrington, speaking of reflexes, calls "impingement") which the affective tendencies themselves stamp upon these mnemonic rearousals.

This paper of Jaensch introduces us plainly to "characterology" or "personalistics", a new branch which was the subject of several rather important papers at the Congress. Among these papers we shall limit ourselves to mentioning that of Stern of Hamburg intitled Personalistiche Psychologie and that of Prinzhorn of Frankfort having as a title Echt-Unecht, ein Versuch neber den tieferen Sinn der Charakterologie. In spite of their undoubted practical importance, these two papers do not offer concepts of great theoretical value.

And even the two papers of Kretschmer and Wiersma, belonging to the group Beziehungen zwischen somatischen und psychischen Eigenschaften, instead of treating the theoretical and philosophical sides of the question, deal only with the various bodily symptoms corresponding to such and such normal, or pathological mental dispositions of the individual.

To these studies of "characterology" or "typology" or "personalistics" we must make the same objection as to those of Jaensch which we mentioned in the preceding paragraphs: namely, that we regret that they do not make sufficiently evident the fact that the mental type is always determined in its fundamental lines by its affective nature and more especially: first, by the prevalence or the predominance over all others of a well determined affective tendency, this tendency coordinating and grouping about itself, as around a center, a constellation of less important affective tendencies that it supports

and reënforces, and of which each, in its turn and according to the particular case at the moment, functions as a vicarious representative of the principal tendency; or, secondly, by the presence in the potential state of a multiplicity of affective tendencies, often contradictory, susceptible of activating sometimes one and sometimes another, stamping the conduct of the individual with a character, not of "coherence", but of "incoherence".

"All that is mental," writes Stern, "can be understood only in so far as it is considered as a moment of the total personality, depending upon it, and can be explained only by means of its subordination to the whole." Now this "total personality", on which all depends and by which all is explained, is, from the moment the affective unification is effected, nothing but the affective tendency which has succeeded little by little in taking the upper hand and in imposing itself on all the others. When this domination of a tendency is absolute, one finds oneself in the presence of what is called a "strong personality", a "character all in one piece", and everything then becomes a result and expression of this tyrannical affective predominance. But, we repeat, before this happens the individual may be constituted of several principal affective tendencies, in opposition to one another. In cases of this kind, one has to do, not with one personality, but, in substance, with a bundle of several personalities, according as the one or the other of these affective tendencies becomes active and dominant. If we do not take account of all these facts we shall never understand the contradictions in conduct which often lead the psychologist astray in his "personalistic" predictions

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Much more important from a theoretical point of view were the papers of Ludwig Biswanger, Th. Erismann, G. Ewald and Ed. Spranger on the difference between understanding and explaining (verstehen and erklaeren). Following the distinction today classic in Germany, between naturwissenschaftliche and giesteswissenschaftliche Methode, that is, between the method of investigation from without, experimental, objective, causal, and the method of investigation from within, introspective, subjective, comparative-following this distinction, we say, these four German writers support the thesis according to which we understand when we are able to apply and follow the introspective and subjective method; while we explain when we are able only to apply the objective and causal method. "A fact, an event lived, is understood psychologically," writes Biswanger, "not in its being or its real process but in its sense or its intentional content. To understand psychologically is to understand in terms of the motives, or, more briefly, to understand the motives," while "we see the essence of explanation in the demonstration of the necessary relation existing between two objects." "The usual language." writes Erismann in his turn, "suggests to us several indications relative to the difference in meaning between understanding and explaining: I understand what you tell me; I understand why he acts thus, that he aspires to a certain end; on the other hand, I do not understand the meaningless (sinnlos) dance of the atoms, even if it were possible for me to construct from them and consequently to "explain" in its entirety the becoming of nature. stand the explanation of the physicist but I do not understand the existence and the becoming of the material world which he 'explains'." "In the sciences of nature," writes Ewald, "research is conducted objectively, with the aid of the inductive explicative method, approaching things from without; in the moral sciences, it is conducted subjectively, by a method founded on sympathy and comprehenson, approaching things from within." In other words, understanding, according to these authors, means an analogical comparison of a given phenomenon with certain of our finalistic actions and tendencies; while explaining involves an approach to a phenomenon by the method of causal deduction. In the first case, we should have a finalistic explanation; in the second, a causal explanation.

Although it is a question here only of defining certain terms and although one exposes oneself in this way to the danger of raising useless questions of words, it seems to us more in conformity with the common usage to say that we understand an object, or phenomenon, or act, when we succeed from the beginning of the perception or by means of a rapid intuitive reasoning quickly to classify this object, phenomenon, or act under some one of the affective or utilitarian (technical) categories familiar to us. But when this affective or utilitarian classification is made only by following a deductive reasoning which permits us, according to our theory of the nature of reasoning, to have the novel object or phenomenon, which is presented to us, derived from a thought combination of other events familiar to us, we then say that we have explained this phenomenon or object. More briefly, one understands by immediate intuitive classification; one explains by mediate classification arrived at by means of reasoning. To explain is to go deeper than to understand, because the explanation connects phenomena between which at first sight no link exists; but to explain requires a longer and more tortuous path than to understand.

We have evidence for this contention in the fact, for example, that we say that we understand a given action of our fellow-being when we succeed immediately in classifying it, by analogy, with certain of our actions which are aroused by certain motives, but that we say, on the contrary, that the psychiatrist succeeds in explaining certain odd actions of a mad person when it is necessary laboriously to derive them from the combined play of certain elementary mental factors which alone are familiar to us. And we have further evidence in the fact that when an object, for example, pushed beyond the edge of the table falls on the floor, we say that we understand, and not that we explain, why it has fallen to the floor; while we employ the term explain when we speak of the astronomer who succeeds, after a long process of reasoning, in reducing the various modalities of the tide to the same law of gravitation under which belongs the phenomenon, so familiar to us, of the fall of the object from the table to the floor.

But our thesis perhaps approaches that of the authors whom we have mentioned in that the subjective method, seizing and for the most part classifying the things immediately by intuition, without need of long reasoning processes, understands, more often than it explains; while with the development of the scientific deduction, the objective or "naturwissenschaftliche" method explains more often than it understands.

In any case, there remains the fact on which we have insisted in our Psychology of Reasoning, that to understand, on the one hand, and to explain on the other, both represent only an affective and utilitarian (technical) classification, more or less immediate or mediate, of the new and unknown

phenomenon, object, or event which is presented or produced for the first time before our eyes.

And here is precisely the time to insist on the action, still so misunderstood or underestimated, that the affective tendencies exert on all mental phenomena. Not alone, let us repeat, to understand, to seize the meaning of, an object and to explain it, are mental acts of affective or utilitarian (technical) classification; but the formation of concepts themselves represents simply the mental act by which we range given objects, equivalent under such and such a given affective or utilitarian relation, under such or such categories. And will represents only an opposition between an affective tendency directed towards a future end and another affective tendency directed towards a present end; it is only when this opposition results in a victory of the first over the second that one witnesses what is called an act of will. And attention, in its turn, represents only an opposition between a primary affective tendency towards a certain end and a secondary affective tendency which holds momentarily in suspense the first, for fear that abandoned to itself it will not attain the desired end. Pleasure and displeasure, joy and sorrow, gaiety and sadness are only the satisfactions and dissatisfactions of given affective tendencies at the moment of their activity-their free and complete activity giving pleasure and joy and their interruption provoking displeasure and sadness. Reasoning itself, that intellectual activity par excellence is nothing other than the unfolding of simply imagined experiences, this unfolding being effected under the impulsion of a primary affective tendency which forces the imagination to create such and such other account of things, and under the control of a secondary affective tendency which, at each stage of attentive reasoning, holds in suspense the primary tendency for fear that to such or such of the simply thought experiences may be attributed a result which is not exactly the one that the experience should give if it were effectively executed.

Now this great participation, continued and omnipresent, of our affective activity in the whole of our mental life, the fact that it is these affective tendencies, and they alone, which move the mind, stimulate our imagination, direct and control our reasonnig, in short, fashion and model our thought—this participation and this fact, let us repeat, are generally misunderstood or underestimated by the psychologists of our day.

A noteworthy exception to this tendency, among the papers given at this Congress, is the paper of Claparéde of Geneva on Le problème de la volonté. This writer is quite in agreement with us in distinguishing between intentional activity (activity directed by a single affective tendency which is not impeded by any other) and voluntary activity strictly speaking, in which "there are two desires in conflict." Thus he arrives at the conclusion that the will "has as a function the settling of questions regarding ends while intelligence has the function of solving problems of means." No statement is more exact. The writer adds, however: "In this conflict of tendencies it is only when the superior tendencies win the victory that we say that there has been will." In our opinion, on the contrary, it is not a question of superior or inferior tendencies, but of an affectivity directed towards a future good and of an affectivity directed towards a present good, and one can speak of will only when the victory has been won by the first. A burglar who has stealthily broken into

a house represses his appetite when he finds himself before food in order to hasten to lay hands upon objects of value in which he sees promise of future advantages; a cornered bandit tears himself from the arms of his mistress to flee and avoid future pain of imprisonment: Both these are veritable acts of will, of the same nature as that of the Alpine climber who fights against fatigue and disregards it in order to attain the summit—the object of his aspirations.

To these problems relative to affectivity and will belong the paper of Prof. Ponzo of Turin, Der Ausdruck des Willenfaktors in der Atmungskurve, in which he studies the manner in which the mental states constituting or related to voluntary acts are expressed in the respiratory curve; the paper of Young of the University of Illinois, An Analysis of Observation in the Field of Affective Psychology; that of Sjoebring, Pleasure-Displeasure and Character of Object; that of McDougall, Pleasure, Pain and Conation; finally, that of the Hindu psychologist, Gopalaswami, The Genesis of the Laughter Impulse, a Suggested Modification of the McDougall Theory.

On listening to this last paper we had the impression that no more than the theory of McDougall (according to which laughter is an antidote to depressing sympathy, in that it keeps us from experiencing a painful feeling in the presence of certain ridiculous or other discordant peculiarities which we notice in our fellow-creatures), does the modification proposed by Gopalaswami (according to which laughter should be the antidote against "the accumulation of the depressing effects caused by a multitude of little deceptions") succeed in overthrowing the older classic theory according to which laughter (and its attenuated form, the smile) consist of only a sudden relaxation of the muscles which have been contracted by fear, by an attitude of self-defense, by an energetic act in the initial stage—this sudden relaxation being affected at the moment when the subject suddenly becomes aware that what has happened or may still happen is quite different from that which, according to his expectation which had caused the contraction, was about to happen. We have examples of this in the laughter of one who, having had a fall, discovers suddenly that he has not hurt himself at all; in the laughter of children, which is made up of a state of fear in its phase of disappearing, and of a state of assurance and tranquillity in its phase of beginning; in the smile of the woman who, after resisting the male with the tension of all the muscles of her body, ends suddenly by yielding herself to sexual desire with a relaxation of all her muscles. And from these examples, the most typical and simple, selected to illustrate the origin of laughter, one passes easily, by means of transformations and gradual derivations, to more complex cases in which the origin of laughter, while remaining fundamentally the same, is at first sight less evident.

There is a problem which belongs strictly to that of the intimate and continued participation of the affective activity in the mass of our mental manifestations and which has remained until our day buried in obscurity just because these relations have escaped the attention of the psychologists; it is the problem of consciousness.

In our study of consciousness, published for the first time in the form of an article in Scientia, reprinted in our Essays of Scientific Synthesis

and reproduced later in an amplified form in our work on the Psychology of Reasoning, we have shown that consciousness, far from constituting an intrinsic property of such and such a mental state, as such and taken in itself, is an extrinsic property of each of the different separate mental states—a property springing from certain modalities of affective relations which exist between the states. In other words, each mental state is neither conscious nor unconscious by itself; it is only the one or the other by relation to another mental state; and each, while being conscious by relation to another mental state A, may be unconscious by relation to another mental state B. We have shown at the same time that the unity of consciousness is due to the large extension of the cerebral seats of the affective tendencies themselves, an extension which in most cases makes impossible, at any given moment, activation of more than one affective constellation at a time (except in the normal cases of distraction and in the pathological cases of the doubling of the personality).

Now, the several papers of the Congress which, directly or indirectly, deal with these problems of consciousness or of its unity or of its doubling, do not succeed, in spite of the great value which they possess, in casting a very vivid light on this field precisely because they do not take account of this relativity of the conscious states and of the affective nature of their re-

lations.

Let it suffice us to cite as an example the otherwise excellent paper Consciousness and Motor Response, by Langfeld of Princeton, who sees in the motor reaction the fundamental element of consciousness. Now the fact that many movements remain unconscious (all the acts which we perform in a distracted state, even the movements which we execute when we walk in the street while thinking of things which have nothing to do with walking), proves in the most manifest way that the motor reaction, be it contemporaneous with a given mental state or immediately following upon it, does not suffice, by itself, to communicate to this state a conscious character; while, on the contrary, the conscious memory of the sight of the Bay of Naples does not contain or imply any motor elements.

The paper by Kraus of Prague, Zum Problem des Unbewussten und der Einheit des Bewusstseins, and that by Oesterreich, Einheit und Spaltung des Ich, do not bring to this field any more clearness and do not help us better to understand these questions.

Oesterreich, for example, distinguishes two fundamental theories: that of the synthesis of the self (moi) and the monad theory. This last states fundamentally only that the self (moi) results from the fact of the existence of . . . . self: "The monad theory of the self sees in the connection to the self of the subjective contents of consciousness a qualitative factor specific and primary." The other theory, that of the synthesis of the self, of which one may say that the beginnings go back to Hume and which is still today that of the Anglo-Saxon and French psychology, sees in the self "a link uniting a bundle of perceptions or of functions." To which Oesterreich objects that this "link" (lien) "does not let itself be discovered", that one does not know what it is. On this point, it is true, the English associationistic school presents an omission, that with which the configurationists, of whom we have spoken, reproach it—it sees in the perception and comprehension of an object only a synthetic perception and comprehension of a bundle of elementary sensations.

This gap is, however, easily filled if we assume that the link, which Oesterreich declares undiscoverable, is constituted, quite simply, by the one or the other of the affective tendencies existing potentially in our brain, the one or the other becoming, after having been aroused and having persisted for some time, the thread which weaves together one with another all the varied events of a sensorial order (perceptive, motor, etc.) which are produced while it persists, under its impulsion and its control.

And it is when two different affective constellations find themselves exceptionally aroused at the same time (either in normal cases of distraction or in pathological cases of doubled personality) that two distinct links are formed giving place to two selves (deux moi) equally distinct and different.

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The pathological doubling of the personality introduces us directly to abnormal psychology. At the Congress which we are considering, however, this field had but few representatives. In the paper of Renschburg of Budanest. Die Fehler des geistigen Apparates, ihre Psychologie, Physiologie und Physik. one again finds the above regretted incomprehension of the functioning of the affective tendencies in all our mental activity. The author in fact does not seem in the least to suspect that the majority of errors or faults or insufficiencies or omissions of our mental functioning have as a cause a defect of an affective order: for instance, there occurs a lack of will, when the affectivity directed towards a future good always or nearly always succumbs before the all-powerful affectivity concentrated on a present good; a lack of attention, when the intensity and the possibility of duration of the secondary affective tendency destined to hold in suspense the primary tendency, are insufficient as against the eruption of the too intense primary tendency; incoherence of reasoning, when the primary affective tendency, which ought to activate reasoning and direct it, is of insufficient intensity and duration; errors of logic, arising from the insufficiency of intensity and duration of the secondary affective tendency, and so forth. One will find the demonstration of what we here advance in our previously mentioned work, Psychology of Reasoning, more particularily in the three chapters devoted to the pathology of reasoning (dreams and madness).

In his paper on the Troubles du dynamisme mental et leur interpretation psychologique, Minkovski of Paris, without expressly recognizing or affirming this importance of the affective factors in the most fundamental mental troubles, nevertheless shows some apprecation of them. Referring to the Bergsonian opposition between instinct and intelligence, this writer seeks to show that the essential difference between schizophrenic dements and dements in general is that in the latter the instinctive, intuitive dynamic activity remains most obvious, while with the schizophrenics it is the reasoning and static capacity which predominates.

We point out in this connection that the instinctive and dynamic activity is that activity which receives its stimulation from one or another of the primary affective tendencies, not inhibited, nor held in suspense by any secondary affective tendency whatsoever; while the reasoning and static capacity is that which manifests itself when it is precisely these secondary tendencies which come into play.

As one might expect, the papers on experimental psychology, of a practical rather than theoretical nature, were very numerous. They were concerned with educational problems, professional orientation, the selection of the best individuals for certain work, services, or functions, etc. They comprised a large collection of small experimental investigations, such as James cleverly characterized as "microscopic psychology", and which Binet with no less wit has called "clock-work psychology." It is, however, undeniable that, when this branch of psychology is unified and systematized, it will be able to render the most useful practical services and increase the "output" of each individual for the greatest good of the social whole.

Let us cite from these numerous papers: La sélection des mieux doués and L'utilisation des tests dans l'organisation scolaire by Buyse of Tournai; Application du test collectif de Ballard dans les écoles belges and La fonction globale et l'enseignement de la lecture aux enfants normaux et anormaux by Decroly of Brussels; Neuere Untersuchungen ueber totale und diskrete Aufmerksamkeit by Kutzner of Bonn; Mesure de la vitesse des mouvements ches les ecoliers by Foucault of Montpellier; Arbeitspsychologische Untersuchungen by Poppelreuter of Bonn; Value of Personal Research by O'Rourke of Washington; Die Bedeutung der persoenlichen Gleichung fuer den Lenkenberuf by Klemm of Leipzig; Experimentelle Untersuchugen ueber die freie Wahlentscheidung by Ach of Goettingen; Ueber den Vibrationssinn (on the close relationships between vibratory tactual sensations and acoustic sensations) by Katz of Rostock; Experimental Studies in Consonance and Rhythm (on the methods of measure of the musical capacity), by Wynn Jones of Leeds.

In her paper, Zur Frage des praktischen Denkens, Franciska Baumgarten presents the problem of a "Taylorisation of Thought," that is, of the means of teaching to reason well in everyday problems those who do not possess great natural capacities in this respect. This teaching is given by the Pelman Institute "which proposes to develop practical sense and thought in those who possess neither the one nor the other." And there is a magazine, Der deutsche Denksport, "the program of which is to submit thought to veritable mental gymnastics."

The paper of Charlotte Buehler, Die ersten sozialen Verhaltungsweisen des Kindes, contains some excellent observations on the first social manifestations of newly born infants and of children up to one year of age,

Other papers have both theoretical and practical interest, as the one of Lewin, Die Erinnerung an beendete und unbeendete Handlungen, which holds that interrupted actions are recalled better than those which have been completely finished, and this because of the fact that the affective tendency which was at the basis of the first and stimulated them has remained unsatisfied; or the paper of Marie Grzegorzevska of Warsaw, Les schèmes tactiles chez les aveugles, which shows that the tactile schemes distinguish themselves from the visual in this: that the latter include and condense, so to speak, a series of simultaneous impressions, while the first are formed on the basis of successive impressions, as a progressive palpation in time of the different points of an object of which one wishes to know the geometrical form. Whence the tendency of the blind to "reduce the most complicated relations to the essential geometrical forms."

A sub-group of papers on experimental psychology is formed by those dealing with the so-called psychogalvanic reflex. We cite especially the following papers: The Conative Indication of the Psychogalvanic Phenomenon, by Aveling of London; The Variation in Shape of the Psycho-electrictachogram, by Godefroy of Amsterdam; Some Experiments of the Psychogalvanic Reflex Phenomenon in Monkeys to Simple Stimuli Provocative of Impulsive Reactions, by Gopalaswamy of Mysore, India; Zur Frage vom psychischen Korrelate des psychogalvanischen Phaenomens, by Linde; The Physics of the Psychogalvanic Phenomenon, by Thouless of Manchester.

It is known that the psychogalvanic reflex consists in this: when one puts two electrodes of an electric circuit on any two points of the body, no electric current is produced in the circuit so long as the organism is experiencing no emotion; but when any modification comes in the psychical conditions of the subject, especially when there is strong emotion, the galvanometer makes a sudden turn, especially when the emotion is strong; many writers hence think that the galvanometer may serve as a measure of the intensity of an emotion. Abramovski has even used it to measure the effort of will. After having provoked emotional states and taken note of the galvanometric deviation in connection with these states, he again provoked emotional states as nearly identical as possible with the first, but at the same time asking the subjects to inhibit the emotional reactions as much as possible, by an act of will. In this way, he obtained a diminution which, according to him, may serve as a measure of the effort of will.

These experiments on the psychogalvanic reflex show once more that in their intimate nature mental phenomena differ but little, in essentials, from all the other strictly speaking physiological functions. These experiments, then, offer beside their practical results much of philosophical importance.

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To experimental psychology belong also the researches in "behaviorism." These investigations, inaugurated and followed with an especial ardor in America, have terminated, after extending from animals to man, in the "reflex psychology" of the Russian psychologist Bechterev.

This question is treated from the point of view of general methodology by Piéron of Paris in a paper entitled La psychologie comme science du comportement et le behaviorisme. One gets the impression that the attempt to eliminate or to depreciate introspection as a method of psychological investigation is supported. This, in our opinion, would be a most serious error. Introspection permits one, in fact, to discover psychological laws, to analyze complex psychical phenomena by resolving them into their most elementary constituent parts, to truly explore the foundation of all our mental lifesomething that no behaviorist or reflex psychologist is able to do. This is what Piéron himself recognizes when he says that certain reactions of our fellow beings can be made objective only by the aid of the spoken word. But it certainly is not the spoken word which transforms the introspective process into an objective process, for the spoken word of our neighbor who informs us of the condition of his mind acquires a meaning for us only if we associate with this word certain states of our own mind which we know only and uniquely by introspection. Were all our psychological knowledge acquired

by introspection destroyed and wiped out from one day to the next (an hypothesis, moreover, inconceivable), the reflex psychology of Bechterev, so much in vogue in Russia today, would be incapable by itself alone to furnish us even the most remote explanation of the simplest and most familiar act.

Here is something to say and to repeat: the veritable method, the principal method, of psychology is *introspection*. By introspection we not only discover, and that by a direct method, the most fundamental laws of our mental activity, we not only succeed in predicting the conduct of our neighbors and in adapting our existence to a social environment in which we are plunged and in which we are called upon to live, but it is uniquely by introspection that we are able even to interpret the data that have been given us by the other methods called objective and exterior (experimental psychology, behaviorism, reflex psychology, and so forth), methods which, without introspection, would be deprived of all meaning and would be for us absolutely worthless.

We have evidence for this, if there still be need of evidence, in the paper of Buytendink of Groningen, Ueber Orientierung bei hoeheren Tieren, and in one by Lafora of Madrid, Hallucinations experimentales, d'origine corticale, ches les animaux et chez l'homme. In order to explain the behavior of the animals examined, the writers of these two papers have, in fact, had recourse constantly to interpretations of purely introspective origin.

To reject introspection in psychology would be equivalent to failing to reckon with the meaning of words when reading a book; it would be making, as Heymans well noted in his inaugural address, a "psychology without a mind" or, something still more serious, a "science of the mind exclusive of the mind."

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In passing from individual to group psychology we come upon the interesting paper of Karl Buehler, Zur Grundlegung der Sprachpsychologie. In our opinion, however, the writer does not put sufficiently in prominence the somatic-psychological correlates in general, and the motor correlates in particular, of the affective tendencies and of the corresponding emotions, which correlates constitute, in the whole animal kingdom, the first spontaneous symbols (the first origin of all semantics), destined to communicate to others and to arouse in them the same affective and emotional states of which the correlates are the external manifestations. The noteworthy pages which Espinas has devoted to this question in his work on Societés animales have not diminished in their incomparable value. It is from this first communication of an affective or emotional state of a living being that there is afterwards born the other function of semantics, consisting in commanding and directing the activities of others in such fashion as to make them agree with the activity of the one who commands and guides; it is this latter derived and secondary function upon which Buehler alone insists in a singular fashion.

The transition is short from this paper of Buehler's to the group of papers on the psychology of inferior races which include the following papers: The Psychology of the Lower Races, by Bartlett of Cambridge; La Mentalite primitive, by Lévy-Bruhl of Paris; Zur Frage der psychologischen Eigenart der sogenannten Naturvoelker, by Mayer-Gross of Heidelberg; Das primitiv-

mythische Denken und seine Beziehungen zur Psychopathologie, by Storch.

We find excellent the distinction made by Bartlett between the practical mentality of the savage, which is logical like ours, and his imagining process, which differs from ours only in degree because, more than ours, it is free from reality and unfolds itself without any discipline.

According to Lévy-Bruhl, on the other hand, the primitive mentality differs substantially from ours, because "it is essentially mystic and prelogical, understanding by the word prelogical that it does not restrain itself, as does ours, to avoid even the most striking contradictions."

Now the fact that this primitive mentality does not avoid contradiction in its imaginative constructions rests only on the fact that in these constructions no secondary affective tendency of control ever intervenes to stop what our experience has taught us to be contrary to reality. And if this secondary tendency does not intervene it is precisely because in these fantastic constructions the savage has never had the opportunity to hurt himself in contact with this reality. When this reality makes itself felt in the course of material work, then are met the deceptions which give birth to the secondary affective tendency of control even in the primitive man, who in this way acquires logical aptitudes similar to ours, according to Bartlett. In other words, the logical capacity is acquired only as a result of the continued deceptions that we undergo when we proceed . . . . without logic.

There is, then, no substantial difference between the civilized and the primitive man. In each are manifest two distinct activities: the alogical, imaginative activity and the practical, logical activity. Only the relative extent of these two activities changes with civilization, and that to the advantage of the logical. But where the deceptions have no opportunity to be produced under the pressure of reality, and such is the case in the imaginative activity, the logical sense is not formed; otherwise stated, there is no emergence of the state of attention aiming to turn aside errors, to avoid the deceptions met with in the past.

This is why certain imaginary constructions of primitive peoples resemble, as Storch shows, our dreams; and this resemblance (as we have shown in our *Psychology of Reasoning*) is due to the fact that there is absent from dreams, on account of their "non-affectivity", all secondary affective tendency of control, suitable to present an obstacle to illogical constructions.

Moreover, even with civilized peoples, logic, which is developed rapidly in practical mental activity, develops, on the contrary, very slowly in speculative thought. We have evidence of this in all the philosophical religious speculation of the Christian patristic and scholastic schools of the Middle Ages, in all the great metaphysical speculations of the past and in the works even of our modern philosophers.

The last group of papers is connected in a certain measure with the preceding and is concerned with religious feeling. We shall note the paper of Pierre Janet of Paris on L'excitation sociale dans les sentiments religieux. The writer derives religious feeling from the need of being loved, supported and directed, and especially from the need of being aroused by means of certain social relations with our fellow beings or with equivalent imaginary beings, in order to strengthen our own forces and to build up our own psychic

tension (this need being felt especially by the psychasthenic). This need of psychic excitation is satisfied in the religious man by means of relations which he establishes in his imagination between himself and God, considered as a superior being, and which replace those of dependence and fear, equally exciting, which exist between son and father, between the woman and her lover, between the slave and his master, between the isolated individual and all society which surrounds and has mastery over him. In his paper The Psychology of Religion, Jones of London (a great adherent to psychoanalytic theories) shows the religious feeling to be a survival from infant mentality: "The religious life represents a dramatization, on a cosmic plan, of the emotions, fears, and aspirations which are born of the relations which bind children to their parents." Leuba of Bryn Mawr (United States), and Thouless of Manchester, in their papers on The Nature, Methods and Field of the Psychology of Religion, deal especially with questions of method.

All these papers, though certainly excellent and very interesting, nevertheless exhibit a regrettable lack arising from a failure to understand or a tendency to underestimate the social function that religion has been called to exercise in order to constitute the "mental frame work" necessary to transform a simple conglomerate of human beings into a social organism—a function which we brought out some years ago in our study of the religious phenomenon.

Psychology alone is unable to account for the facts of religion. In spite of its numerous mental elements, all of an affective nature, the religious phenomenon is, above everything, a social manifestation which can be explained only in so far as one understands the nature and the functions of the social organ constituted by the religious institutions and the priestly caste. Let us not forget that "sin" is always, at the beginning, a directly or indirectly antisocial act.

It is to this social function, so necessary among the peoples of antiquity, that the religious institutions were indebted for their development in the past; and if in the present they suffer a slow atrophy it is because their function becomes less and less useful among civilized peoples. The religious institutions can escape this only when they gradually change their function, as they have among the Anglo-Saxons, into that of teaching or moral education; that is, when they give themselves only the function of inculcating, by affective and emotional communication, the moral feelings which are necessary to social life and to the continued rising of the group toward the more and more noble and elevated forms of progress.

We have now arrived at the end of our hasty review of the principal papers of the Congress which will certainly remain one of the most important in the annals of psychological science.

To give our synthetic judgment of it we shall sum up our view in the following manner: In all that concerns practical questions, the immediate application of psychology to education, the choice of a vocation, the selection of a personnel capable of making the greatest output, the general Taylorization of all human activities, industrial and commercial, much progress has been made and still other achievements are being made, but we should like very much to insist, even in this branch of psychology, upon the necessity of more

securely founded guiding theories capable of introducing into these researches and their results a more unified coördination.

Much progress has also been made in pathological psychology, although one feels here a still greater and graver need for a healthy theoretical guidance: we cite in this connection only one example, that of the great and somewhat exaggerated popularity which Freudianism now enjoys, in spite of the inconsistency of certain of its theoretical principles and the artificial character of certain applications which it deduces from them (to begin with, its method of interpreting dreams).

On the other hand, as regards theoretical questions properly speaking, we can only make ours these words which the venerated president of the Congress, Prof. Heymans, pronounced in his opening address: "The period in which we live is not for psychology a period of rapid progress along beaten paths; it is in part a period of doubt and discouragement, in part a period of hardy attempts to find new solutions as different as possible from the old."

Now, the principal cause of this state of doubt and discouragement on the one hand, and, on the other, of iconoclastic frenzy which concerns itself with overthrowing, as having lost all value, even the surest and most important achievements of the past, rests in the fact that psychology does not yet occupy among the sciences of life the place which is appropriate for it. In fact, some go to the extreme (as did the English associationists) of considering psychology as a science entirely detached and distinct from biology, having no essential point in common with it; these thinkers run the risk of constructing an edifice without a firm foundation. Others go to the opposite extreme (as do the experimental psycho-physiologists, the behaviorists, the reflex psychologists) of viewing psychology merely as a branch of physiology and (still more serious) as amenable only to the purely physico-chemical methods so popular today in physiology; these scholars run the risk (already serious for biology but infinitely more serious for psychology) of introducing, even in the latter, the most rigid and narrow mechanistic conceptions by rejecting, as unscientific (even in psychology!), all finalistic conceptions. This last extreme is quite simply equivalent to denying even the facts and phenomena which psychological. science is called upon to study and to explain.

It is to restore a proper balance between these two extremes and to put psychology in the place which belongs to it among the sciences of life which was the aim of the paper given by the writer of these lines under the title of: En quoi consiste et d'où dérive le finalisme des phénomènes psychiques?<sup>2</sup> After having recalled all the other finalistic manifestations of life (from assimilation and metabolism, from the phenomena of reproduction, from those of preëstablished adaptations and new adaptations, to the behavior of inferior organisms, to reflexes, to instincts, to affective tendencies and to all our mental activity) we showed that the finalism of our mental activity is closely allied to all other finalistic manifestations of life with which it shares its origin, since, like these other manifestations, it has as its source the mnemonic property of living substance in general.

When one envisages in this manner the exact place that psychology holds among the sciences of life, when one is willing at the same time to remember the finalistic character inherent in every pulsation of life, and to draw from

A translation of this paper is presented in this issue of The Monist.

this fact the result that it implies, to know that the affective tendencies are finalistic manifestations par excellence, in which is resumed and towards which converges all the finality of the organism, one makes possible the inauguration of quite a new current of psychological investigation, which, far from destroying and depreciating any achievement whatsoever of the past, reestablishes many of them in strength and connects them one with another and to the new achievements.

This amounts to recognizing in substance that, contrary to what was believed by the English associationistic school (today attacked and defeated on this point by the configurationists of whom we have spoken above), sensations are not the only elements beginning with which one can recompose all the complex phenomena of mental life, but that the ultimate elements are of two kinds, sensorial and affective; that it is affective activity which impregnates all the manifestations of thought itself; more than this: that it is their activity which is the sole and unique constructor of thought, and which uses materials of a perceptive order, stored up in our sensorial memory accumulations, in order to build the whole edifice of our imaginative and rational mind, from the most humble and lowliest intuition of the mentally impoverished to the most superb creation of the man of genius.

We allow ourselves to hope that, in spite of the defects which it no doubt presents and which are due in a certain measure to the very novelty of the field explored, our work, *Psychology of Reasoning*, already mentioned several times, is of a nature to bring out the results to which this new and fundamentally affectivistic position of psychological research is likely to lead, in explaining all mental phenomena, even the most complicated, even the most "intellectual", such as reasoning in its highest form—such as mathematical and metaphysical reasoning.

However that may be, this Congress,—the second since the War to reunite psychologists under an international caption, but in reality the first to reunite fraternally equal numbers of psychologists from the two groups of countries formerly at war,—however that may be, this Congress, we think, left with all those who had the good fortune to attend it the best impression. By its perfect organization (for which we must thank, besides the president, his indefatigable general secretary Prof. Roels), by the meeting of the most eminent psychologists of the entire world, even from Japan, India and Mexico, by the great vivacity of its discussions, the Congress furnished evidence of the great vitality, of the vigorous and fertile ferment of thought which today animates all those who are devoted to this admirable object of investigation, the microcosm of our mind.

At the same time, by the cordiality of relations which has not for an instant diminished even between the representatives of the two groups once at war, by the firm personal friendships which were tied there even between savants who had never seen each other previously, by the disinterested enthusiasm of which each gave proof in recognizing and proclaiming the worth of investigations made by others, the Congress gave to all who took part in it the anticipation of what the civilization of tomorrow can be and ought to be when it shall be enlightened by the torch of human brotherhood sustained and kept alive by the highest nobility of thought.

MILAN, ITALY.

EUGENIO RIGNANO.

## THE MONIST

## PHILOSOPHY AND RELIGION

THE most striking difference between European and Indian philosophy is perhaps to be found in their differing attitudes to the problem of the relation of religion to philosophy. Since the early days of Greek thought philosophy and religion have been at war. Xenophanes and Colophon raised the banner of revolt with his satiric description of the gods and goddesses: "Yes, and if oxen and horses and lions had hands, and could paint with their hands, and produce works of art as men do, horses would paint the forms of the gods like horses, and oxen like oxen, and make their bodies in the image of their several kinds." "The Ethiopians make their gods black and snub-nosed; the Thracians say theirs have blue eyes and red hair." He poured scorn on Homer and Hesiod for having ascribed to the Gods "all things that are a shame and a disgrace among mortals, stealings and adulteries, deceivings of one another." No wonder if under these onslaughts the religious faith of at least a few enlightened individuals began to shake. The seed was sown and under the withering dialectic of Socrates religion in the sense of the ordinary traditional religion was routed out by the philosophical schools, and the divorce betwen the two came to be the dominating note of European philosophy in the ages to come. It is true that in the Middle Ages there flourished some of the subtlest intellects that Europe has ever produced, and in them the demands of both seem to have been harmonized, but the dominant interest of the age was religious, and philosophy had to accomodate itself to the religious demands of the

In other words, philosophy had to play the second fiddle, and freedom, which is the very breath of philosophy, had to be sacrificed, so as not to offend the powers that were. In modern European philosophy, the philosophers that have made the history of philosophy were men suspected by theologians. Most of them refused to subscribe to the dogmas of the Church, and those that did were almost apologetic in their tone. No wonder if the Roman Catholic world still looks to the philosophers of the Middle Ages to square its philosophic hunger with its religious convictions. What is even more noteworthy in European philosophy is the sense of pride that philosophy has emancipated itself from the thraldom of religion. Philosophy has to reign supreme. It is from this standpoint that Indian philosophy is criticized as yet continuing in the stage that was transcended on the very threshold of Greek philosophy. On the other hand, in India it is this very divorce between philosophy and religion that is regarded as the weakest and the most vulnerable point in Western philosophy. To an average Indian, religion is the salt of life and a philosopher without religion sounds mere materialism, a thing of mere intellectual jugglery which may as well be not studied as studied.

It is clear that this difference of outlook is fundamental. Which is the correct attitude? Is any reconciliation between these two hostile attitudes possible? These are the questions that this paper seeks to answer.

In the very beginning we must frankly face the fact that there is no reconciliation possible between philosophy and the great historic religions in the dogmatic garbs which they have assumed during the lapse of centuries. For, philosophy, to be true to its name, must be based on reason, while the historic religions are all based on revelation, which claims to be above reason. Their appeal is to the faith of men. "Believe and ye shall be saved" is their

exhortation. This can be the only justification for the elaborate theological systems which have been constructed on the basis of the simple teachings of the great Masters. The maintenance of such a system requires an elaborate organization of priesthood, a body of men often learned and as a rule tenaciously conservative. To them reason has no claim whatsoever to sit in judgment on the truths of revelation as conceived by them. Thus it is that a conflict between the free spirit of philosophy and a dogmatic theology was inevitable, and this conflict runs right through the history of European philosophy. The question arises at this stage as to how it is that Hinduism as a religion has not come into conflict with philosophy. Prima facie it stands out as an exception to the rule that mere faith and philosophy cannot live in peace together. Is it because the claims of reason are subordinated to the inspired Vedas and the Upanishads? in which case philosophy can subsist only in a restricted sphere with its wings effectually clipped. Or has philosophy been allowed full freedom of thought, and yet it has independently established the truth of the Vedas and the Upanishads? It is interesting to note that the highest pramana recognized by Indian philosophers is the sabda pramana (proof by the Word or Revelation). If this is taken literally, we cannot escape the conclusion that philosophy in India must at bottom be theology. This is a criticism which has been freely advanced against it by European scholars, who argue moreover that Indian philosophy has not advanced and cannot advance because it has no independence: it can only be a theology. The validity of this criticism, however, is challenged by Indian scholars like Mr. V. Subrahmanya Iyer. As an Advaitin he is not concerned to repudiate the correctness of this criticism so far as the other schools are concerned. So far as the Advaita is concerned, he maintains that Sankara was not a theologian; that his arguments are all

logical and philosophical, and the references to the Vedas were only meant to support the conclusions of his independent thought. If this claim could be substantiated, the conflict between philosophy and religion would be automatically solved. Has it been substantiated?

At the present day the Vedanta is the only living school of thought in India, and it subsists in the three forms of Advaitism, Visistha-Advaitism, and Dvaitism. In the last two the interest is predominantly religious; their ultimate authority is the Vedas and the Upanishads; their injunctions are mostly sacerdotal in character; their philosophy has its strength mostly in an astute criticism of Advaitic premises. Hence if an independent and a purely logical philosophy exists in India, it is to be found only in the Advaita of Sankara. In Advaitism the only reality is Brahman, which is nirguna or without quality. In the last resort there is complete identity between the human atman and the Nirguna Brahman, and a man attains moksha when he attains through gyana or knowledge this identity. It is clear that the Nirguna Brahman ex hypothesi cannot be personal, for a person implies qualities, i. e., it cannot be the God of religion to be placated with sacrifices or won over with gifts. If there was any doubt at all on this point it is set at rest by Sankara himself, for he identifies the God of religion or Iswara with Saguna Brahman. This is the God that may be worshipped, and rituals and ceremonies and the caste organization and a hundred other things find their justification with reference to it. But Saguna Brahman is not the reality, it is itself in the world of maya. To a gyani, to one who has mastered the reality of Nirguna Brahman, the Saguna Brahman has no worth. Religion with its restrictions is not binding on him, it has no joys or terrors for him. It is meant only for the masses, the ordinary struggling weak humanity, the ignorant. To them alone is the worship of Iswara real, not to the gyani.

It is clear that the worship of an unreal *Iswara* is radically opposed to the deepest convictions of the truly religious. For them God represents the highest reality, and the innermost desire of their hearts is to walk in the path of righteousness as chalked out for them by His chosen Prophet, and to be at one with Him in a thorough communion of spirit. To them Sankara's Iswara is nothing but the merest mockery of God. No wonder if the orthodox Vaishnavaite speaks of an Advaitin as a nastika (atheist.) It is a fact indeed that an average Advaitin manages to harbor in his mind the conception of a Nirguna Brahman, while devoutly performing the worship of Saguna Brahman, and fulfilling a hundred duties connected with the observance of caste regulations. He fails to find any inconsistency in his religious worship and his philosophical convictions. In fact he feels it to be his duty to carry on his usual worship, not because he believes in its efficacy or in its truth, but as an example to the younger members of his family, as a concession to the frailty of ordinary humanity. If this is the only reconciliation possible between the traditional Hinduism and philosophy, an honest thinker might well wonder if this is a reconciliation worth having, for it amounts to nothing more than a working compromise in no way differing from the way in which an astute lawver or a business man lays the flattering unction to his soul that business is business, wherein the ordinary canons of morality find no place. Thus it is that Sankara can be said to have made good his claim to be a philosopher and no mere theologian. But religion from the standpoint of the Reality has been given a go-by. is real only to those who do not know better, just as to an ignorant child a doll is as good as a living baby. There are so many Advaitins in India who think they have solved the problem of the relation of religion and philosophy, and yet it is only a solution, if it be a solution at all, in which

religion is given a place on sufferance, as a make-believe, a concession to the masses, ultimately of no more worth than the fleeting sense experience, which is the main stay of the theory of maya. From that standpoint religion is only a stage in the upward growth of man, something like what a kindergarten is in the education of children. Even if the teaching of Sankara on this point can be taken to be a definite solution, it is certainly not a solution of the problem we are dealing with. To the religious-minded, to the soul that is hungering to commune with a personal God, Sankara's philosophy appears cold and bleak. They feel bewildered before its ruthless logic, but they find it a logic, subtle yet unconvincing.

We noted in the very beginning of this paper that a reconciliation between philosophy and traditional religion is impossible, and the one exception that seemed at least plausible—Sankara's Advaitism—has been found to be no real exception. It is a discouraging conclusion, and so it is all the more necessary to try and see if it is possible to reconcile in any sense the warring claims of philosophy and religion. To do so we have to be clear about the significance of religion. To begin with a definition of it would be mere dogmatism. We should first of all be clear as to the implications of religious experience—for it is on this experience that the truth of religion is sought to be established—and then try to see in what sense a religion is possible that is not in flagrant contradiction to the dictates of reason. An appeal to reason in one form or another is inevitable, for the craving for religion finds expression in religions, and religions are not consistent with one another. As to which is worthy of our acceptance and our homage is—or at least ought to be—a matter of reasonable thought. Of course an ordinary man does not trouble to think about this; he is content to believe what his parents have believed: religion is to him something that has to be accepted in the same spirit as the country in which he is born. But from this point of view the cannibalistic religion of the savage has as much right to credence as the highly advanced monotheistic religions. Even among the latter there are marked differences, and the superiority of Judaism or Christianity, Zoroastrianism or Mohammedanism, Hinduism or Buddhism can only be settled at the bar of reason. So, from the philosophic standpoint, the ultimate survival value of a particular religion or of religion in general must necessarily be determined by what harmonises most with reason, or at least by what comes least into conflict with reason.

All religion implies a belief in the existence of something that is superior to us: whether that something is conceived as a fetich, or as personified forces of nature, or as a plurality of divine beings, or as one supreme God. In any of these cases the recognition of a superior power implies in us a consciousness of our weakness and a sense of humility. The next step, whether psychologically or logically, is to have a desire to be on the right side of this superior power, and this marks the beginnings of worship. In primitive religions this worship is more the outcome of fear than of an exalted emotion. But with the growth of knowledge and a sense of human kinship a higher type of morality supervenes which affects the conception of God. He comes to be thought of not as a jealous, angry or bloodthirsty god, but as one who is full of mercy and love for struggling humanity, who is to be worshipped not as an ogre, but as a loving Father. This is the stage to which the highest religious consciousness has attained. God becomes not merely superior to us, He becomes supreme in the whole universe. In the language of metaphysics, he becomes the Ultimate Reality. Once this stage is attained, worship takes the form of love and devotion, till in the case of God-intoxicated individuals like the mystics and the bhaktas (devotees of God) this love of God takes the form of an ecstatic union with God, which is mystic experience par excellence. It is on the reality of this experience that the truth of religion and the truth of God are asserted. It would hardly be fair to doubt the reality of it, for it is associated with some of the loftiest teachers of humanity in all climes and in all ages. Zoroaster, Isaiah, and Christ were all mystics. Even in more recent centuries the flow of mysticism has not been exhausted, as is evidenced by the line of Christian mystics in Europe like Eckhart or St. Francis or St. Teresa and the Sufi mystics of Persia; and India has ever been the home of mystics like Kabir and Chaitanya, Ramdas and Tukaram and a host of others. There is a remarkable resemblance in the outpourings of the mystic heart: love, joy, communion with the divine. To illustrate the point we may adduce a few examples from Kabir, the prince of mystics.

"If you merge your life in the Ocean of Life, you will find your life in the Supreme Land of Bliss."

"There is an endless world, O my brother, and there is the Nameless Being, of whom nought can be said.

Only he knows it who has reached that region: it is other than all that is heard and said.

No form, no body, no length, no breadth is seen there: how can I tell you that which it is?

He comes to the path of the Infinite on whom the grace of the Lord descends: he is freed from births and deaths who attains to Him.

Kabir says: 'It cannot be told by the words of the mouth, it cannot be written on paper:

It is like a dumb person who tastes a sweet thinghow shall it be explained?" "

From the depths of his loving soul Thomas à Kempis cries out: "Ah, Lord God, when shall I be entirely united and lost in Thee, and altogether forgetful of myself? Thou in me, and I in Thee; even so grant that we may in like manner continue together in one."

This desire to be at one with God is the mark of all religion, and the fulfillment of that desire marks the acme of a religious personality. For this reason we may define religion as an emotional realisation of the Ultimate Reality. It is certainly not intellectual in character. Mystics employ no arguments except poetic analogies; they make no pretense of convincing by logical arguments. In fact more often than not they refuse to talk to any except those who are already in some way prepared to feel a hunger for God.

So far there is nothing in mystic experience to antagonise philosophers. Both accept that man is not ultimate. Both believe in the existence of something supernatural, some sort of ultimate reality. They part company in two respects. The religious mystic emphasizes emotion and intuition, while the philosopher seeks to grasp the significance of the ultimate reality through reason. This difference is a matter of detail and need not be emphasized. The other difference is more pertinent to our inquiry: religion conceives the ultimate reality as a personal God, while philosophy on the whole conceives it as impersonal—on the whole, for philosophy differs with philosophers. Theism is a form of philosophy, but it would not be wrong to say that the weight of the greatest philosophers, whether in ancient Greece or modern Europe (e. g. Spinoza and Hegel) or India (e. g. Sankara), is thrown on the side against theism, and in the traditional conflict between philosophy and religion it is the anti-theistic philosophy that has had to bear the brunt of warfare.

For the purposes of this paper it would be too long to substantiate the position that the ultimate reality must be conceived as impersonal, but to avoid the charge of dogmatism we shall briefly point out the main difficulties involved in theism. First of all, the attributes of omnipresence, omniscience and omnipotence are not reconcilable with one another. Omniscience involves a knowledge of the future and this gives rise to the dilemma: either this foreknowledge must come true, which means a palpable limit to omnipotence, or omnipotence must involve the possibility of doing anything at any time, in which case foreknowledge loses its edge. It is possible to argue that God cannot be conceived as an irresponsible despot, but that He is Himself bound by the laws of His own devising; that even He is bound by His own laws of righteousness and justice. This is an eminently sensible position to maintain, but it reduces the compatibility of omnipotence and omniscience to mere verbosity. Further, personality implies finiteness. The very rise of this conception has been due to the necessity of expressing the play of a finite human self on the stage of life. There has been an inveterate tendency on the part of human beings to be anthropomorphic and to conceive God in the image of man, a procedure which can hardly be countenanced by sober reason. To conceive Him as a personality is to make Him finite, when the essence of God is His infinitude in al directions. The conception of personality may be the highest possible to bring out the superiority of man on earth. Whether it is so high as to be applicable even to the Highest is certainly open to question. The general prejudice against describing God or the Ultimate Reality as impersonal is for the most part due to the mistaken idea that impersonality implies lifelessness, rigidity, inertia. Far from this being the case, the philosophers who emphasize the impersonality of the Ultimate emphasize it as a principle of activity essentially rational.

But the theist continues to argue: "From your standpoint what becomes of worship and the worth of mystic experience?" The answer to this is that worship is only the homage of the heart to what our head recognises as supreme on rational grounds. No sane person has ever

arrogated to himself the powers of God, though the misdirected zeal of followers may at times have conferred the halo of divinity on their favorite heroes. On the other hand, every person who has not been victimised by the cheap logic of pessimism or of naked atheism has felt the call of the highest. The genuine leaders of human thought in every country and age have borne witness to the presence of something great, something exalted, something that makes for order, for righteousness. It is this consciousness that sustains men in their battles against chaos and unrighteousness. It is their consciousness that reason ultimately rules the world that gives them strength to keep up their courage in the midst of disappointments. This consciousness is there: latent in all, actual in most. The difficulty comes when we seek to express this consciousness. Our mind is baffled in its struggle to envisage this Reason, Logos, God or whatever we choose to call it, in Its immensity, power and glory. In this incapacity of the human mind lies the root of the desire to personify. Our heart yearns to worship. But we cannot worship an idea, however much we are convinced of its truth, and so we are driven to symbolize, and our religious worship slakes its thirst in the worship of symbols: fire in Zoroastrianism, idols in Hinduism, the cross in Christianity, Mecca in Mohammedanism, not to mention the forgotten creeds of the past. The wise recognize the One under the formalism of a thousand symbols. That is why the language of the mystics is the deepest language of the human heart, and throbs with the same pulse of life. Where they differ is in the different names under which the One presents itself: to the Hindu it is Rama, or Vishnu or Shiva; to the Christian it is Christ; to the Moslem Sufi it is the beloved. The ignorant and the fanatic confound the symbol with the Real and seek to exhaust the richness of the One in some arbitrary symbol of human creation.

But the average theist is not likely to be satisfied with this selfless worship. He wants a God, to Whom he can pray: ask for favors and seek forgiveness. Now it is remarkable that this demand is made only by the lesser minds. The genuine mystics, the genuine adorers of God scorn this demand. They do not ask for favors, they do not grumble against the unkindness of their lot in life. They are content to be the *bhaktas* (devotees) of God; they rejoice in poverty, in adversity; they have a childlike faith in the righteousness of things:

"God's in His Heaven,—
All's right with the world!"

They merely crave for communion with Him, and when they find it, the craving of their soul finds rest.

Thus it is that the demands of the highest philosophy and the highest religion coincide. The God of religion need be nothing but the personified aspect of the One of philosophy. The justification for this personification lies in the finiteness of our intellect: what we cannot adequately conceive we must first personify and then symbolize. Art is not the less intellectual because of its symbolism, and religion gains in worth when its mode of worship finds a rational justification.

At this stage there is every likelihood of a voice of protest coming from the camp of the pure rationalist. "If you can get no tangible reward," he argues, "from your worship and your prayers; if your sins are not forgiven, where is the sense of worshipping? Why waste time in idle prayers? In fact your argument reduces worship and prayers to a mere luxury of the heart: a pageant to delight the senses with the fragrance of incense, the music of hymns, the drama of color. It is a palpable make-believe, a device to hold the masses in leash, a mere show, nay a sham. A philosophy which seeks to rationalize such mummery is doubly guilty: because it is untrue to itself,

and because by a specious rationalization it seeks to perpetuate the tyranny of priests who find their last prop in the ignorance of the masses." I should be the last person to deny that there is considerable justice in this indictment. It has been the universal misfortune of all religions that they have been mutilated and tortured out of shape to suit the second rate intellect and more often the cupidity of an organised priesthood. But the ritual that has been the creation of an interested priesthood—while it has succeeded in capturing the imagination of the masses—has been uniformly repudiated by the true bhaktas, for their heart has rebelled against the prostitution of divine love that is the result of vicarious sacrifices and prayers. They believe in the worship of the heart which makes them purer and better men. The real justification of prayers is to be found in the fact that they exert a purifying influence on the mind and contribute to the development of the mind. This is a truth which was always well understood by the Upanishadic psychology, and has recently been well recognised by Western psychologists under the compelling influence of Coué in France. Couéism together with the indubitable instances of telepathy and clairvoyance has irrefutably established the power of the human mind. Through the activity and concentration of mind things have been achieved that are ordinarily impossible and that in ignorant ages were justifiably regarded as miracles, but that in our scientific age can be easily explained as the result of the almost limitless capacity of our mind. The power of auto-suggestion has been shown to be a conqueror of nervous diseases through the commanding influence of the mind, and this logic applies equally to its power over our thoughts.

Thus prayer and worship, when practised with the requisite amount of sincerity and concentration, become the grand instruments of self-culture, and herein lies their fullest psychological and philosophical justification. They are

the means of concentrating our mind on higher things and thereby attuning ourselves to the spirit that pervades the world. To conceive prayer as the means of asking for favors or forgiveness is to misconceive the essential purpose of prayer. According to the law of Karma the past cannot be undone, but sincere repentance is a conquest over the future so far as it makes a repetition of the old sins impossible. Sincere prayer strengthens this repentance and thus purifies the sinner. As has been mentioned above, the true devotees of God do not care to ask for favors: they only want to be one with Him, and to achieve their purpose they become lost in bhakti, devotion, prayer. It is immaterial how God is named; it is enough if He is conceived as the Spirit of Righteousness, Asha, Rta, ruling the universe. The very uniformity of mystic experience proves the truth of this, for the Christian attains Him through the worship of Christ, and the Vaishnavite through that of Sri Krishna, and so on in different religions. The immediate object of devotion is-or at least sounds-different, but the ultimate object is just one, howsoever differently He is called.

The need of having some tangible object of worship is at bottom psychological, for the human mind finds it hard to grapple with abstract concepts, and the tendency to personify is one of the most deep-rooted in our nature. The concept of the Universal Reason, Nous Brahman, is one that cannot be visualised. And yet to prevent the mind from wandering some object of concentration is needed. The need to personify the Ultimate is pressing and the concept of a personal God is the result. At this stage, what is more natural than to conceive the Supreme in terms of a known hero, who has already distinguished himself as a great warrior or lawgiver or teacher? He becomes the visible embodiment of Godhead; the symbol and the Symbolised are confused, and in historic sequence the worship

of the One takes on different forms agreeable to the genius and the history of different peoples.

The intimate connection which has through the ages subsisted between religion, poetry, music, architecture and painting, has not been accidental. All art is personification, and religion, by a deep-seated need of the mind, tends to be centered in some personified deity. Primitive religion and mythology are the first crude philosophical ventures of the human spirit. It has taken centuries for us to outgrow these mythologies—and yet who can say that we have completely outgrown them even today? But if we have outgrown them at all, the credit of it must go to the patient, clarifying thought of the philosophers and the discoveries of the scientists. With a better philosophy our religion has bettered too, for religion is nothing but personified philosophy. If philosophy has established the supremacy of some one concept, our head is satisfied with it, but our heart in its yearning for worship needs its personification, and in the highest religions God is nothing but this personified aspect of the One of philosophy.

The main threads of our argument may perhaps be as well brought together. The task of philosophy is to comprehend the Ultimate Reality, a task which is essentially intellectual in character. The ordinary traditional religion with its emphasis on faith and on revelation is not competent to replace philosophy and so the two are incompatible. But philosophy in its intellectualism is not satisfying to the heart, unless it can develop a religion which is not inimical to the supreme dictates of reason. Such a religion is to be found in personifying the Ultimate of philosophy, and in fact that is what every great religion consciously or unconsciously has done, and that is why it has been able to hold its place in spite of its crude dogmatisms. I do not mean to say that the object of religion is a fiction, as Sankara conceives *Iswara* to be a mere part of maya. The

personification is justifiable from the standpoint of the need of worship and prayer, which are the grand instruments of self-culture, as recent psychology has shown. In the last resort the God of religion and the Ultimate of philosophy are identical. The former is an expression more suited to the aesthetic and the emotional aspects of our nature, while the latter expression is more suited to the intellectual side of our nature. Both are justified, because in an individual human being all the sides of his nature are not equally developed, and each man must have the freedom to envisage the Ultimate Reality in the way best suited to him. Religion and philosophy are but two modes of apprehending the ultimate nature of the world. God and the Absolute of *Brahman* are but two names to designate two aspects of one and the same reality.

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# CURRENT REALISM IN GREAT BRITAIN AND UNITED STATES

HAT the first, genial period of the realistic movement I in the English-speaking countries is over will, I believe, be granted me by those in touch with the literature. The possible lines of interpretation have been carefully canvassed and the various positions have been formulated with a fair degree of precision and definiteness. Thus we are able to contrast English neo-realism with American neo-realism and both with critical realism. It would appear to be the case that the preliminary exploration and search for possibilities has been carried through and that we are about to enter upon the stage in which there will be a struggle for survival among these suggested possibilities, a struggle which will involve clarification and modification, no doubt, but also the rejection of certain theses and analyses and the acceptance of others. It is in this fashion that philosophy slowly grows.

This realistic movement is likely to seem tremendously important to the thinker who has participated in it. He sees it as a right-about-face in Anglo-American philosophy. Not only was it a protest against the perspective and assumptions of traditional idealism; it was also an effort to build afresh upon the foundations of the sciences. It stood for an ingenious and persistent attempt to study perception with its associated meanings and beliefs and to pass thence to the higher reaches of knowing.

I have suggested that the first period of the realistic movement is over. There are many signs that this is true. First, no novel realistic doctrine has recently been suggested—a fact which is not surprising in view of the daring of the inaugurators of the movement who went to extremes which challenged probability; and, second, the attention of philosophy is already swinging to cosmology, as is illustrated by the increasing interest in the theory of nature and in the solution of the mind-body problem along monistic lines. It is highly probable that the struggle for existence among realistic doctrines will be affected by the results of this new development which will cast light back upon epistemology.

Assuming, then, that the stage of the formulation of realistic hypotheses is in the main past, it will be my endeavor to give a survey of them, linking them with the names with which they should be associated, and to add to this survey some measure of criticism, evaluation and suggestion. Though I myself represent a specific type of realism, I have always tried to be open-minded and to regard critically my own position as well as that of others, holding as my ideal that objectivity and tentativeness which characterizes science in its treatment of hypotheses.

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It is natural to divide current realistic doctrines in the English-speaking world in some measure along national lines because, when all is said, those who live together and know each other personally influence each other most strongly. Philosophy is international and yet in its growth bears the marks of its social environment. If a certain thinker makes an analysis, he is apt to be followed therein by those who come directly under his influence. There is in this the unavoidable effect of personal prestige. Thus we shall see that the English realists have usually

had a somewhat different notion of mind and mental acts than have Americans. To what does this go back? Perhaps to the influence of G. E. Moore and Russell, and perhaps from them to the work of Meinong and Brentano? In this matter, the American tradition has followed James, Hume, Mach and, perhaps, the empirical psychological and biological outlook.

There is, in short, a characteristic convergence in each country of international and intranational influences. The English thinker will not be surprised at this fact if he will bear in mind the differences between Oxford and Cambridge in these matters. Of course, we must not oversimplify the situation for there are exceptions to test the rule. Thus Mr. Russell has both influenced American thought and been in turn influenced by it. His book, *The Analysis of Mind*, illustrates this interaction very well. But, in Mr. Broad, we cannot fail to note the effects of inbreeding.

We must not forget that realism is, after all, a very old tradition in philosophy, far older than the idealism which submerged it during the latter half of the nineteenth century. This is not the place to investigate the reasons for this temporary submergence, and I shall content myself with pointing out the fact. Cartesianism passed into Lockian representative realism and thence into sensationalism. Was this a degeneration, or an advance, or something of both? In any case, English philosophy lost its vitality and fell a prey to Kant and Hegel. Perhaps, there was much in the Zeitgeist of romanticism and in the struggle with the inordinate claims of a mechanistic science of a reductive type to reenforce this turn which philosophy took and to give idealism a strength which is already seeming curious to the present generation.

But such an historical study is not my present task. The plain fact seems that idealism was not equal to its task. It did not face up to the facts discovered by the

sciences, and seemed to consider itself an escape from their pressure. Dissatisfaction was certain to manifest itself.

This dissatisfaction expressed itself at almost the same moment in personal idealism of a pluralistic type, in pragmatism, and in realism. The spell was broken, and a new wave of thought swept over men's minds. Thinkers who were not by nature disciples came to philosophy with the problems of the sciences in their minds and with something of its logical technique controlling their methods of approach. They felt the need of a basic reformulation, of a fresh start. It was their task to analyze, reflect, and analyze again, yet with always some attention for the larger setting. Until the biographies of this generation are written, we shall not know the full forces which directed philosophy along realistic lines; but some of us can make a shrewd guess as to their nature. We must not, of course, make the mistake of assuming that too great a homogeneity of outlook existed. The influence of a plastic naturalism is evident in some; in others, we find an almost Platonic note.

So much for the setting of realism. We must now pass to our promised survey of actual positions. And I think it will be best to begin with the English phase of the movement. While the swing toward realism was practically contemporaneous on the two sides of the Atlantic, the formulation of it in England was more precise and clearcut. American thought was more experimental and varied. Another reason for beginning with the English development is the recognition accorded to Mr. Russell's work in mathematical logic by the American new realists. Their theory of analysis seems to have been built up largely upon it as a foundation.

Mr. G. E. Moore fired what is usually considered the opening gun of the attack upon idealism in his essay entitled, "The Refutation of Idealism." This was published in *Mind* in 1903 and has been reprinted with nine other essays of his in a book called *Philosophical Essays*, dated 1922. Mr. Moore, who is now professor of mental philosophy in the University of Cambridge, has not been a prolific writer but has been very influential. He owes this influence to his painstaking analysis of problems, his refusal to be satisfied with the superficial. Whether he has shown as much power in construction is doubtful. But he might well reply to a critic that he was persuaded that the first task was that of analysis since the foundation had first of all to be laid.

The distinction upon which Mr. Moore puts so much stress is characteristic of this English type of realism. It is that between the mental act of awareness and the object of that act. He speaks of this mental act as a sensation because he has in mind its difference from thought of a more developed kind. He argues that the mistake of the idealist has been the assumption that what we are aware of is the content of our sensations, an inseparable aspect of them. But such a position, he maintains, involves a denial that we can be aware of anything. The idealist is logically involved in solipsism. In contrast, Moore stresses the basic importance of a relation which he calls "awareness of anything". Every experience includes this factor. It is that which justifies us in calling any fact mental. This doctrine of a transparent cognitive relation which is mental but is not itself the object of a mental act stands out as a thesis which had tremendous influence upon other English realists. It gave a simple structure to their analysis of cognition. The act of awareness is mental, the object is not necessarily so; and the object is unmodified by this act of apprehension.

Those who wish to read a characteristic exposition of his views at the present time should read his statement of them in the Second Series of Contemporary British Philosophy, which is entitled, A Defense of Common Sense.

Whether this distinction between act and object was suggested by Brentano and Meinong or was worked out by himself I do not know. His development of it is, however, peculiar to himself and had its influence upon Alexander, Broad, Laird and Russell.

Bertrand Russell has probably been the most conspicuous figure of the English movement. He owes his prominence to various factors among which we may mention his pioneer work in the fusion of mathematics and logic. It would, I think, be generally granted that his contributions to symbolic logic were marked by careful scholarship and ripe reflection. We would select for special mention Principles of Mathematics, Principia Mathematica (with A. N. Whitehead), and Our Knowledge of the External World. In the domain of theory of knowledge, his little book, The Problems of Philosophy, helped to direct attention to a position very similar to Moore's. Mr. Russell has been a prolific writer, seemingly able to touch upon almost every subject and gifted with a strikingly clear style. His very virtuosity may have robbed us of systematic works comparable to his Principles of Mathematics. His latest definitely philosophical contribution is his Analysis of Mind. In it he shows a swing in the direction of the American approach in so far as it took its departure from William James's famous essay, Does Consciousness Exist? The psychological position called behaviorism has also exerted influence upon him. In our summary discussion of Russell it will be best to confine our attention to his logic and to his view of mind.

In his contribution to the First Series of Contemporary British Philosophy, Russell describes his philosophy as logical atomism, preferring this description to that of realism. He has always stressed the importance of relations for logic and for our thought of reality. The tendency to monism in the past is, he believes, due in no small measure to the emphasis upon the subject-attribute structure. Logical atomism means distinction of type in facts and propositions. Terms must not be confused with relations. They are distinct and irreducible. Logic is the study of recurrent forms. The influence of mathematics is shown in his adoption of the expression, "propositional function", for the logical form which contains variables which may be replaced by specific terms. "X is mortal" is a favorite instance of such a propositional function. In place of x we may put Socrates or Wilson or John Smith,

It is his contention that a large number of the paradoxes which afflicted philosophy were due to bad logic and bad mathematics. On the whole, he seems to have established this contention, though it is probable that the last word has not been said in mathematical theory upon infinite numbers and upon continuity. This incursion of mathematical methods into philosophy has been most stimulating and useful.

In his theory of knowledge, Russell has moved from a position akin to that of Brentano and Meining to one which approaches American neo-realism. He writes as follows: "My own belief-for which the reasons will appear in subsequent lectures—is that James is right in rejecting consciousness as an entity, and that the American realists are partly right, though not wholly, in considering that both mind and matter are composed of a neutral-stuff which, in isolation, is neither mental nor material. I should admit this view as regards sensations: what is heard or seen belongs equally to psychology and to physics. But I should say that images belong only to the mental world, while those occurences (if any) which do not form the part of any 'experience' belong to only the physical world." It should be noted that this is a structural view of mind and consciousness.

S. Alexander deserves space in such a survey as ours because he was one of the first to work out realism in a systematic way and to connect it with cosmology. His two-volume work, *Space*, *Time and Deity*, has much in it that is admirable. We must, however, confine ourselves to the epistemological side of his speculation.

Alexander developed his realism gradually, and we have articles of his in the Proceedings of the Aristotelian Society and in Mind which reveal the line of his advance. It is clear that he begins by rejecting the possibility of a new type of representative realism. His statements to this effect are explicit. He finds himself in harmony, then, with Moore and with other English realists in the theory that the object of awareness is non-mental and that awareness is a contentless act. Even images are in some sense physical. It would seem that this theory leaves little to psychology. And it is not surprising to find that Alexander is favorable to behaviorism. A distinction of his which has attracted attention is that between enjoyment and contemplation. This distinction corresponds to the difference between the mental act and its object. The object is contemplated; the act is enjoyed. So long as we are concerned with the apparent structure of a simple act of cognition, this contrast seems a natural one. But it may be questioned whether it is any more than a functional division. We have already noted that Russell and the American neo-realists, following James, are inclined to question even its functional existence. In this they are probably going

<sup>&</sup>lt;sup>1</sup>Russell, The Analysis of Mind, p. 25.

too far. But we should note that Alexander makes of it an opposition of stuff.

Having determined his epistemology and given it an empirical, immediate content, Alexander proceeded to disclose its cosmic context. Under the influence of relativity notions, he makes space-time the ultimate reality. It is the stuff out of which all particular things are made; even universals find their place in it as a spatio-temporal pattern. We now meet with the theory of emergence which postulates the rise of new qualities in an evolutionary way. Thus mind is a term for the mental acts intrinsic to the brain. So far as possible, we find Alexander seeking to merge knowing into the general relation of compresence, which characterizes all things in the world. Yet he recognizes the special nature of awareness and puts it high up in the scale of evolution.

Alexander is a systematic, ingenious and daring thinker. He has exercised marked influence upon the work of such important thinkers as Whitehead and Lloyd Morgan.

There are many other philosophers in England whose epistemological work deserves mention. Percy Nunn is one of the pioneers in the field. His little book, entitled The Aim and Achievements of Scientific Method, has been influential. John Laird is a defender of the essentials of common sense. His position savors very strongly of the traditional Scottish school. His Problems of Self is probably his best work. As regards theory of knowledge, he follows fairly closely in the footsteps of Moore and Alexander. This is seen in his Study in Realism, which is a clear statement and defence of the essentials of neo-realism. Dawes Hicks is a keen critic much of whose work has been done in articles and reviews. He emphasizes the discriminative capacity of the mind. L. A. Reid has developed a position very close to that of American critical realism. His Knowledge and Truth is in many ways an

admirable piece of reasoning. C. D. Broad of Cambridge is a realistic thinker who has remarkable balance. He has shown himself able to follow the recent developments of mathematical physics and to interpret them to the general reader. In this ability he resembles Russell. In fact, no one could fail to place him in the group associated with Cambridge. His epistemology represents in many ways a return to Locke but, of course, with a difference. He accepts the distinction between primary and secondary qualities, thus breaking with neo-realism, and adds to the primary qualities such a factor as energy. In accordance with the English tradition, he makes much of the sense-data which are given in perception. These data seem to be thought of by him, not as discriminations but rather as definite entities which are non-mental, though not physical. He seems to continue to hold a restricted idea of mind. Sense-data are a tertium quid between mind and physical object. His chief works are Perception, Physics and Reality, Scientific Thought, and The Mind and its Place in Nature.

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In the United States the realistic movement began in a broad and tentative way. James, Santayana and Woodbridge were among the first on the field. Shortly thereafter, appeared most of those who have since made contributions. Gradually a division between the "new realists" and the "critical realists" became evident and was sharpened by means of the cooperative volumes which the two groups published. It will be most convenient to consider the doctrines as a whole and to mention the writings of the particular thinkers incidentally.

James and Woodbridge sought to interpret mind realistically as a kind of relation between objects existent in their own right. It was an attempted return to naive

realism combined with an attack upon the traditional realm of the subjective. In fact, the subjective has been in bad repute with American thinkers as a whole. James's doctrine was called by him radical empiricism and assumed that the raw stuff of reality was immediately given and that the difference between the physical and the psychical was merely one of relationship or perspective. We have already noticed that Russell has come under the spell of this theory.

Meanwhile, a younger group were working away at a systematic analysis of knowledge from the realistic stand-Distinctly intellectualistic in their approach, they laid emphasis upon symbolic logic and upon what Russell has called logical atomism. Their chief doctrine was similar to that of the English movement, viz.,—that the object itself is given in the field of experience. In other words, they, also, rejected the possibility of making a fresh start along the lines of a mediate, or representative, type of realism. It has become customary to call their position epistemological monism to signalize this literal presence of the object. Thus this book which I perceive is an actual external object in no sense dependent upon my perception for its existence. Its being perceived is just an external relation into which it has temporarily entered. This doctrine demanded the development of the logic of relations and it was for this reason that these thinkers gave so much time to symbolic logic, believing, as they did, that the logic of analysis gave their epistemology its foundation. It may be that they were deceived in this belief, but it cannot be denied that it helped to bring about that efflorescence of mathematical logic so characteristic of Harvard, as it is of Cambridge.

The new realists drifted in the direction of behaviorism by denying the peculiar mental act so conspicuous in the English theory. Mind is increasingly conceived in terms of the response of the organism. Such a development led in the direction of the complete denial of consciousness as peculiarly private and subjective. The intraorganic is simply harder to get at and to make an object

of knowledge.

One other point should be noted. Like all theories of immediate realism, the new realism holds that the very stuff of reality is given in the field of experience. And this stuff is analyzable into particulars, universals and spatio-temporal relations. There is the minimum element of skepticism and agnosticism in such an outlook. This perspective is also indicated by their dislike of the category of substance and their adoption of the mathematical term function. In this they agree with Russell who rejects both substance and the non-legal conception of causality.

The chief exponents of the new realism in the United States are Holt, Marvin, Montague, Perry, Pitkin, and Spaulding. Besides the cooperative work, to which they contributed in common, called *The New Realism*, we may mention Holt's *Concept of Consciousness*, Montague's *The Ways of Knowing*, Spaulding's *The New Rationalism*, and Perry's *General Theory of Value*.

I presume that it would be improper not to mention the work of A. N. Whitehead, who now teaches at Harvard. Yet his outlook is hard to classify for it combines cosmology with epistemology in a tantalizing way. Undoubtedly influenced by Alexander and Russell, he yet quickly made evident his own insights. Like all who have come under the sway of relativity views, he substitutes the category of events for that of substance. Does this simply mean an activating of the notion of substance? It is difficult to say. On the whole, Whitehead falls in line with English neo-realism. Take this statement from Science and the Modern World: "This creed is that the actual elements perceived by our senses are in themselves the ele-

ments of a common world; and that this world is a complex of things, including our acts of cognition, but transcending them." Whitehead has been of late a prolific writer, and we may mention his Concept of Nature, Principle of Relativity, and Principles of Natural Knowledge. His books are not easy reading because he develops his own vocabulary as he goes along. Many find a great stimulus in his work and lectures. I imagine his final influence will be greater in cosmology than in epistemology.

Critical realism arose almost contemporaneously with neo-realism, but it systematized itself later and partly in opposition to neo-realism's doctrines. It is a strict form of realism in that it teaches that we know objects which exist external to the fact of knowing and independent of it. But the division comes with the question of the actual presence of the objects themselves in the field of experience. Does knowing involve this? Do the facts permit such a belief? After carefully considering the whole situation, the advocates of critical realism decided that epistemological dualism was more plausible than epistemological monism. We make things objects, we mean, select, affirm them in a specific and definite way; and yet these objects do not literally enter our consciousness. Rather are they interpreted in terms of the meanings and characters which stand out in our perception and in our thought of them.

Perhaps the best way to get clearly in mind the difference between the new realism and critical realism is to note the divergent theory of consciousness. Critical realism thinks of consciousness as a function of the organism in its interpretative response to objects and regards it as an intraorganic realm of a peculiar kind, while the new realism thinks of consciousness as a term for a selection of entities. In other words, critical realism falls more in line with psychological tradition but adds a keener sense of the organic activities which find expression in the field of

consciousness and of the structure, distinctions and references which characterize such a domain. We may say that it puts an extrospective consciousness, engaged in knowing objects, in place of an introspective consciousness, such as traditional psychology has stressed in line with its pure-

ly analytic efforts.

This divergence in their theory of consciousness finds expression in their views of the nature of knowing. While the new realist holds that knowing is the givenness of the object, its literal presence to inspection, the critical realist regards knowing more as an interpreting of a selected and meant object by means of characters discriminated in the field of consciousness. Such knowing is a complicated affair with its meanings and its categories which have gradually been developed in the human mind in its continued response to things.

It may be well to contrast critical realism with English neo-realism also. One important difference lies in the greater scope which critical realism gives to the mental act. While neo-realism has traditionally limited the mental act to a peculiar, and almost transparent, activity of something thought of as mental in a substantial, cosmological way, critical realism does not introduce such problems at the beginning. It takes the mental act as an empirical affair and gives it the content and structure it apparently has. In other words, the mental act seems to the critical realist to be a complex process of interpretation rather than a simple awareness. This difference leads him to take the data of perception as discriminations within the field of consciousness in the art of knowing rather than as entities of a non-mental sort.

It is essential that the interpretation of knowing characteristic of critical realism be sharply distinguished from that of the older (and traditional) representative realism. It will be admitted, I think, that it was the inadequacies

of this that led to both idealism and its opponent, the new realism. Remove these inadequacies and the raison d'être of both of these positions is at the same time destroyed. This has at least been one of the convictions of the critical realist

On the whole, representative realism has been tinged with subjectivism and has tended to assume that we know our ideas first and that it is by a sort of inference that we pass to the extra-mental object. Now this approach led to insuperable difficulties. It was impossible to justify such an inference as a purely logical matter, and it was equally impossible to verify the similarity between ideas as primary objects of thought and external things not given. Having carefully studied the actual situation in knowing, the critical realist stresses the direction of the complex act of knowing. He holds that a sense of an object is a specific ingredient in the act of cognition and that this sense of an object goes with the interpretation of the characteristics of the object. In other words, knowing has a definite structure and content and is by no means reducible to the two operations set up by Locke. It is the external physical thing which we from the first are engaged in interpreting, and this interpreting is a complex affair revealed in consciousness. We have pointed out the differences between critical realism and the new realism; let us now turn to the similarities.

For both, mind is conceived organically in terms of responses of the higher nervous centres. Thus the setting is psycho-biological. For both, the object is independent of the act of perceiving. There is a strong tone of naturalism in the outlook of both. And yet even here come the differences again. The new realism swings in the direction of extreme behaviorism and is skeptical of an intraorganic, subjective realm, while the critical realist accepts such a realm and considers it natural and intrinsic to the total

organic response. This choice in psychology reflects a choice in epistemology. If objects are given and so constitute consciousness, there is no need of a subjective microcosm. If, however, objects are not given but are interpreted in terms of given characters, then such a peculiar, intraorganic domain is needed. I do not see, therefore, how psychology can remain indifferent to episte-

mological disputes.

A similar comparison between critical realism and English neo-realism may be of value. It will be remembered that, for the English neo-realist, the mental act is simple and transparent—even for Alexander it is not much more than an enjoyed sense of direction. We may say that American neo-realism sought to do without even this mental act while keeping the direct givenness of the object, while critical realism enlarged the mental act to take in concrete content and to make of it a structured process of interpretation of an object meant and selected but not literally given. Since the basic theory of knowledge is so different in the latter case, I suppose that the natural line of evolution of English neo-realism is in the direction of the new realism. It would appear that both Alexander and Russell are turning toward it. On the other hand, it would seem equally natural for a position like Broad's to swing toward critical realism.

It would be unfair to the reader who wishes to understand the situation in realistic epistemology to-day not to refer to the differences among critical realists themselves.

There seem to be two trends which reflect a difference in cosmology itself. On the whole, Santayana, Drake and Strong maintain that the datum is an essence which cannot be regarded as a psychological existent and must therefore be considered a logical universal or subsistent. In adequate knowing, this essence is identical with the essence embodied in the object. There is no doubt that this group

519

has put its finger upon a very significant question for critical realism. In knowing, we are trying to interpret the object and an accepted interpretation is supposed by us to reveal the object somehow and in some measure. This claim seems to me the minimum and irreducible feature of knowing. Now the other members of the group are quite aware of the demands of knowing, but they are not persuaded that it involves the postulation of essences of this semi-Platonic sort. Let us examine the complex act of knowing and see whether we can give it a psychological interpretation which, at the same time, does justice to its logical aspect.

A complex act of knowing seems to me a configuration, or Gestalt, with specific characteristics. It is an achievement involving meanings and distinctions and is clearly a high mental level. At this level, the category of thinghood is functioning with its sense of objects and their characteristics. Note that it is within this kind of structure that we as conscious and knowing creatures work. We discriminate characters and at the same time think of them as characteristics of the object we are seeking to interpret. The point to grasp is this, that, in knowing, we assert a cognitional identity between the predicates which we hold before our minds and the characteristics of the independent object. We believe that we are cognitionally grasping the structure and behavior of the object. Or, to put it another way, we believe that the structure and behavior of objects are revealed to us by these predicates. Does such a revelation or cognitional grasping involve an identity of essence? Does it imply that there is a something which is identically present in the mind and in the object? Here is the point in dispute. I, for one, cannot see that it does involve this. Moreover, it appears to me that predicates are distinctions in consciousness.

Ultimately, I suppose, the dispute involves a theory

of consciousness itself. Is consciousness a complex of mind-stuff? Is it a flux of essences. Or is it an emergent and configurated stream of quales within which knowing takes place in an empirical way and in which we as conscious selves are? Drake appears to me to hold the first view, Santayana the second, and several of us the third view. I am inclined to think that epistemology has gone as far as it can without a definite cosmology and ontology. The question in my own mind is this, Which view fits in most aptly with an outlook of the type of emergent naturalism? It is clear that the nature and status of universals is also involved in this division within critical realism. Can universals be given a purely psychological interpretation in terms of discrimination and symbolsm? Or must we assume genuine subsistents which have a non-psychological status? It is to the first position that I myself give allegiance, while the other wing of critical realism is evidently more in line with the traditions of Plato and Aristotle.

Those who have had the patience to follow my analysis of the various epistemological theories of a realistic perspective which the last thirty years have brought forth will, I believe, acknowledge the painstaking character of this development. All relevant questions have been raised and discussed. There has been no flinching from difficulties, no taking refuge in broad generalities. It is for this reason that I am persuaded that genuine advance has been made and that, with an equal advance in cosmology, something analogous to science in its finality will be produced. The realist feels that he is on the right track and it is his hope that, from the struggle which is going on between different positions, something definite will crystallize out.

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## THE REALITY OF TIME AND THE AUTONOMY OF HISTORY

T

PLANCK'S discovery that even the energy emitted by the discrete electrons is also discrete, well entitles him to the sweeping dictum, that "Whatever can be measured is real." The essence of the method of physics is to measure, and the successive discovery of more and more minute units of measurement (atoms, molecules, electrons, quanta) are the milestones of physical progress. Sir Oliver Lodge well exclaimed that soon all discontinuity will vanish and that all experience will resolve itself into an atomic "steeple chase," governed by the laws of mechanics.

With what confidence may we look forward to such an outcome? The major point de resistance is not hard to find. There is the irreducible fact that the laws of science too have a history. The cold and austere formulae of the geometer tell us nothing of the fortuity, the continuity of endeavor and hope which was their price. What is worse, the present laws of science do not reveal the laws which preceded them: only memory or written record can reveal these. Will analysis show that the drama and development which appears in the history of science is only an appearance, that here as elsewhere there is only combination and recombination of the given?

<sup>&</sup>lt;sup>1</sup>Schlicht, Moritz, Space and Time in Contemporary Physics, 1920, Introduction.

The answer of the intellectualists, whether in science or in philosophy, is to the effect that all experience is subject to exhaustive conceptual and quantitative analysis. Each of these modes of comprehension assumes a typical view of the constitution of the universe: the philosopher assumes a reality governed by absolute logical necessity, the physicist assumes a universal mechanic. In both cases it is implied that deeds, recorded by historian or biographer, are not in a special class: they are, above all, not unique ways of understanding but are objects of understanding. But we touch here upon an enigma which has dogged the steps of both philosophy and science since their first inception. We posit a universal mathematic in the interests of clarity, only to find that this device sheds light on all things by the dubious device of concealing all the darkness within itself. A fundamental instance of this is the method of discontinuous analysis by means of which we represent spaces and lines as configurations of points. So far as mathematical clarity is concerned, nothing is wanting. Only, the puzzle as to how such points could constitute real space, or how such space could be traversed. remains an enigma. Now, this method of analysis of space into points was purchased at the price of Zeno's paradoxes, which have been handed down in history like a "bad debt"; and even now Bertrand Russell, Whitehead, and a host of others are seeking to discharge that debt. But meanwhile, do we suppose for an instant that there are no real spaces or real movements over them? Not at all: thanks to the life of decds, the experience of traversing paths is already a source of knowing. Then, can we generalize this, and maintain that all immediate experience and all experience which history and biography record in its immediacy (so far as this is possible) constitute a mode of understanding entirely distinct from that understanding called scientific, which considers, not bare experience, but

its frequencies? Droysen indeed raised the basic issue regarding history (as F. M. Fling avers2) when he asked, "Is there, then, never more than one way, one method of knowledge?" The first point which I wish to urge is this: that history enjoys a certain priority over science: we crowd history out of nature only to crowd it into the history of science. Poincaré well exclaimed that we do not solve nature's problems, we only transfer them to the textbooks! Thus, the notion of dimensionless points is employed in an attempt to resolve the perceptual world into number, and thence, into a formula. But, it turns out that when we press the principle of simplification too hard, problems multiply, so that the analysis of space into points, far from ridding us of history, leaves us with a history of opinions. The only "ultimate knowledge" we attain seems to be the fact that we are disagreed about it. History at least seems to perform one-half of the task of knowing, because it always succeeds in finding past solutions wrong or incomplete. Surely, to "question answers" is just as useful a function as "answering questions".

The more crucial question is, "In what sense could ungeneralized historical events constitute a unique form or source of understanding? Certainly, the events of history and biography are subject to a posteriori generalization such generalization constitutes political and social science. But this would leave the historian a provider of the raw materials of knowledge, not of knowledge as such. We may suppose, with Rickert,3 Fling,4 and others, that the events of history contain a remainder which generalization misses. There are two sorts of such remainders: (a) remainders which are too infrequent to be generalized, and (b) there may be something "remaining" about even the instances and their aspects which have been completely

<sup>&</sup>lt;sup>2</sup>Fling, F. M., "Historical Synthesis", Am. Hist. Rev., IX, p. 3. <sup>3</sup>Rickert, Zur Lehre von der Definition, 1902. <sup>4</sup>Fling, F. M., op. cit.

generalized. The scientist may declare of the first type, (a), that, though they are at present too infrequent to be generalized, time will make generalization possible by multiplying the frequencies. This will not avail, however, because time will also bring new remainders (novelties). Time, which alone can save generalization, is also the agency which defeats it. But, even if there were no "remainders" in the sense of ungeneralized instances, we might still insure unique data for history by urging, as Aristotle<sup>5</sup> did, that history is concerned with the particular, poetry with the universal. Eduary Spranger<sup>8</sup> argued that only by coming into touch with life in its concrete complexity, can we enter into the "fullness of living." Though one might maintain the autonomy of history on the first ground (a), in this paper, I urge its autonomy in the more profound sense suggested by Spranger's words.

Poincaré, always illuminating, is especially convincing on this point. One basic method of exact science consists in counting. But, no matter how far we count, we never count more than a finite number. Yet, says Poincaré, we believe that our power has no limit, and that we can count indefinitely. What taught us this? We cannot say, "past experience". The belief that an absolute mechanism lies concealed in nature is in a similar difficulty. To be sure, past experience shows that we ever find "more and more" mechanism in nature. This fact leads, however, not to one inference, but to two possible ones. There is, first, the conclusion drawn by most thinkers, that if we find "more and more" mechanism, we will inevitably discover all. But this expectation is justified only if there is an absolute mechanism, i. e., a finite one which we may some day exhaust. But if mechanism is an ideal like goodness and beauty, (i. e. an infinite) we might just as sensibly expect

<sup>6</sup>Aristotle, *Poetics*, IX, 3. <sup>6</sup>Spranger, Eduard, *Die Grundlagen der Geschichtswissenschaft*, Berlin, 1905, pp. 143-145. *Cf.* Burr, *Am. Hist. Rev.*, XXII, p. 268. to empty an infinite ocean by finite decrements. The difference between the finite and the infinite may be a difference in kind, not a difference in degree. Russell well exclaims that we required the discovery of the electron and the quantum to teach science how far we are from omniscience! That the notion of an absolute mechanism is an ideal is apparent from the following simple consideration: To demonstrate "absolutely" mechanical laws for massive bodies (as Newton's law of gravity does for the planets) does not establish it for the parts (atoms and molecules, etc.) which compose them. And, to prove an absolute mechanic for atoms, does not prove it for electrons which compose them. We are here in the predicament of an infinite regress, whose goal is the particle so small that it has no area at all, i. e., the point. But whether the dimensionless point may be attained by dividing and subdividing areas is none other than the "bad debt" about which we have only opinions, famed for the fact that that history is literally strewn with their variety: an unhappy predicament for a theory to get into which sets out to attain simplicity.

We wish to prove that there are truths which are independent, not of the fact of experience, but independent of the amount of it.7 There are truths which repetition destroys rather than saves. Such, for instance, are the facts of memory<sup>8</sup> with its live atmosphere of drama and flowing time. Consider your knowledge of the alphabet. We may repeat it automatically, but in vain do we hope to make this automatism of repeating the alphabet yield the individual and laborious trials of our childhood when we "learned" it. This verbal habit, like all habits, has within it no record of its history—repetition tends to destroy the historical datum. Historical understanding of the genesis

Driesch, Hans, Science and Philosophy of the Organism, p. 6.

<sup>&</sup>lt;sup>8</sup>Bergson's familiar argument.

of a thing can be attained only by securing the literal record

of the genesis.

Then, when knowledge reaches "completion" will history or exact science have the "last say"? I believe that both will have their last say; that then, as now, historians may write the history of science, but that this "say" must become "penultimate" when sociology generalizes that history. This amounts to the statement that the time when knowledge reaches completion is a myth and self-contradiction. It is the one mother of fallacies which underlies all of the attempts to resolve history into exact science or exact science into history.

#### TT

### The Omnipresence of History in Nature

We may select time as the reality which is peculiarly resistant to the attempts to reduce nature to a mechanic or to a logic. As science is perfected, time vanishes gradually to insignificance. If we can predict the future path of a planet, it is as though it had already happened. Time ceases to be real because it cannot make a difference. Yet. the notion of perfect prediction is self-contradictory. If we could forecast tomorrow's experiences in their utter fullness, then tomorrow would be undistinguishable from the present, and prediction loses its meaning. When science regards time as insignificant to the statement that "two plus two equals four", it only means that the truth of the formula is not dependent on the time it takes to utter it. That it takes time to utter it is a biological fact: can it also be resolved into a mechanical one? I wish to establish the absolute dichotomy which I believe to exist between the historical and the mechanical point of view by showing that time is an ultimate fact which mechanical analysis cannot envisage. In support of this, I call attention to the following considerations:

Can physics envisage time? It seeks to do so by identifying time as a rate of motion, as a rate of change. This is supposed to put time into the objective realm of "observables". Now, if time is identified with the mechanical movements of a clock, then whatever generalizations we can make regarding past correspondences with the clock's movements, may be expected in the future also. Thus, that which the unlearned call the "contingent" future, now becomes only our ignorance of the past. Yet it can be shown that in carrying through this device, the mechanist overtly employs time in the very a priori sense which he sets out to deny—that in looking to the future to supply a deficiency in his present mechanical generalizations, he is tacitly assuming that time insures the emergence of the unforeseen. This is what Xenopol meant in declaring that the logic of repetition must be supplemented by the logic of succession. Let us see if we are not logically led to this result in considering the meaning of clock time.

The apparent movement of the sun was the first clock, and the successive periods of its return form the convenient units of days. Then, clocks are invented, and made to synchronize with the movements of the sun. This accomplished, time is reduced to a rate of change. But this is far from sufficient for mathematical purposes. Exact science requires (a) time which consists of discontinuous units, (b) that these units be equal to each other, and (c) that repetition of the same time be possible. To achieve this, we divide the dial of the clock into twelve divisions, and assume that these distances measure equal lapses of time. But, note, that we are already beyond the notion of time as a rate of motion. For, the time which we introduce into our formula consists only of the sums of arrivals at the divisions of our scale. Now, time is always "arriving"even if time were identical with uniform movement, the

<sup>&</sup>lt;sup>9</sup>Xenopol, Revue de Synthése Historique, p. 292. Cf. Fling, op. cit., p. 9.

time which we live lies between the intervals of the clock's dial, which are mathematical lines, requiring no time for the clock's hand to negotiate them. Consider the vast discrepancy between this time and time as we actually experience it. Consider an audience waiting for a beloved

play to begin.

This lived time does not consist of a juxtaposition of equal instants, but is continuous, one movement melting imperceptibly into the movement that follows. As we live time, it too has its divisions, but these divisions are not marks on a scale, but are crises, they are "psychological moments" freighted with historical and biographical significance with which the divisions of the clock's scale have nothing to do. In our experience of time, it is the time of waiting which is the most real—the time between the scale divisions. While waiting for a play to begin the time may appear long to the audience, but the placid clock on the wall remains unaffected. Then, why is the clock's time more real than lived time? Only because we posit, by an act of faith, the assumption that the unchanging is the real. Perhaps the truth is that the unchanging is only the useful. that we accept the clock's time because it enables us to make appointments, that is, to make biography or history. To the intellect (witness Planck's dictum) the immediate experience of time is "nothing" because it cannot be measured. But to history, this constitutes rather the reality of time.

We have a similar situation with regard to space. To exact science, pure space is the essence of nothingness. To the will, empty space is real just because it separates us from something, and must be traversed. But, only let this space be measured in unit distances, and science willingly acknowledges its "reality"! Consider a wooded hill which lies before us. Is this space unreal because we do not know the number of miles to its summit? On the contrary, to

our practical sense, counting has little to do with the reality of this space. The very trouble with the line "composed of points" is that it permits counting, but nothing else. It makes no difference whether we say this hill is "one mile" or "320 rods"—number does not make the difference between the rod and the mile, it only labels this difference. The space we traverse is historical, the space we count is mathematical. Between these two some cryptic connection exists, which is not dispelled by calling it "cryptic", and by "postulating" that the clock's time is the "real" time.

The same argument applies pari passu to events. To live events is one thing, to measure them in units is another. Both of these constitute the "truth" about time, but this truth has two ingredients, mathematical and historical. Aristotle distinguished between the "measuring time" (of the clock) and the "measured time". The famous Tristram Shandy paradox will illustrate what we mean.10 Tristram Shandy was a biographer who employed two years to record the events of the first two days of his life. Russell maintains that if we assume the infinity of time, there is not a day in this man's life but that "some day" will be accounted for. It is worth noting that science vanguishes the difficulties which time raises by assuming the infinity of time. Time indeed loses its sting were there an infinity of time in which to repair mistakes and incompletions. Just so the ether of science is posited as being "everywhere", which leads to the predicament that it can be found "nowhere"! But, as regards "real" time, it is always limited. The logic of science is of little avail in the brute here and now in which we live. It is because Tristram Shandy must soon perish that his biography is an absurdity. Even if we grant him infinite life, that will not remove the difficulty, for we conceive the ill-fated Shandy as living

<sup>&</sup>lt;sup>10</sup>Russell, B., Mysticism and Logic, pp. 90 ff

this time, which now appears as a time of waiting which grows ever more and more acute.

The truth is that mathematical time has only a conceptual reality. Even the clock is in the sphere of lived time: even time as motion is continuous, and the clock's time cannot be repeated, since it progressively wears out. The physicist too endures a sort of time which never enters into his calculations. Suppose that a physicist were studying the rate of fall of bodies, and that he were using a pendulum as a measure of time. Suppose, however, that his attention wanders, that he "misses count", and must start the experiment over again. So far as the experiment is concerned, he may "repeat" time by setting the pendulum to swinging anew, but the physicist has "lost" some time which he can never repeat. During the siege of Syracuse, Archimedes was solving a problem in geometry. Who in this instance would urge the puerile principle that all intervals of solar time are equal? If he had chosen another day (albeit of equal length) for this computation, he might have saved his life, and the science of geometry might have been 2000 years further along.

We give time to the clock—it is not the clock which gives time to us. If the clock should suddenly reverse its movements no one would imagine that time has ceased to go forward. When we represent time by means of a line with an arrow-head, we again give time to the line by endowing it with the arrow-head. The notion that time can be repeated has only conceptual usefulness in science. The savant who supposes that there exists a universal mechanic, supposes that all events regularly repeat themselves. But, since this is not demonstrated at present, he relies on future research to remedy this defect. But, not only is historical time "intransitive" (never repeated), but it is limited. Plato well observed that in the realm of the immortals time is insignificant: time, like water, becomes sig-

nificant with scarcity. Time as we live it biographically is the destroyed. This live sense of the fortuity of time I find nowhere so well expressed as in a passage from Delboeuf .11

"My youth, has it not taken flight, carrying away with it love, illusion, poetry, freedom from care, and leaving with me instead science, austere always, often sad and morose, which sometimes I would willingly forget, which repeats to me hour by hour its grave lessons, or chills me with its threats? Will time, which untiringly piles deaths on births, and births on deaths, ever remake an Aristotle or an Archimedes, a Newton or a Descartes? . . . No. what has been will not, cannot, be again. Time moves on with an unfaltering tread, and never strikes twice an identical hour."

C. S. Peirce, 12 our modern Heraclitus, expressed the same thought as follows:

"If man were immortal he could be perfectly sure of seeing the day when everything in which he had trusted should betray his trust, and, in short, of coming eventually to hopeless misery. He would break down, at last, as every good fortune, as every dynasty, as every civilization does. In place of this we have death."

In a sense, the mechanistic view of the world is a struggle against this very fortuity and finite character of time. Note, that if the universe were a perfect mechanism, it could not cease to exist, but could only return to its initial state. We may demonstrate this point in terms of some very recent and highly interesting developments in science.

In physics we encounter certain phenomena which have been called "hereditary", because they exhibit the effect of the past states on the present state of a physical body.

<sup>&</sup>lt;sup>11</sup>Cited from Wm. James, Some Problems of Philosophy, p. 148. 12 Peirce, C. S., Chance, Love and Logic, p. 72.

Now, it is the essence of the idea of the mechanical, that the future state of a body depends on its "present" state. Time does not "bite into physical phenomena", so Bergson expresses it: there is no accumulative addition of its past states. The clock is useful as an instrument to measure time because time does not effect it, the clock neither "learns" nor "forgets" its peculiar function. In instances in which the future state depends on the past state we have heredity. Now, the flexure of rods and rubber illustrates the presence of "hereditary" phenomena in matter. If a steel rod is loaded at one end with weights which successively increase in amount, we will find that when we unload these weights, the rod never returns to its initial starting point. The curve of return is always different from the outgoing curve. Thus, Hooke's law, which expresses the relation between the tension and torsion of a wire as a constant, is only approximately true. This "hysteresis" is present also in phenomena of magnetization, perhaps in all physical phenomena. Volterra<sup>18</sup> calls these phenomena "hereditary." Painleve has attacked this idea, alleging, among other things, that it implies "action at a distance in time." But, Volterra replies, Newton's principle (of gravity) which all physicists accepted until very recently, implies "action at a distance in space", which is equally repugnant. However, Painleve indulges a groundless alarm if he imagines that Volterra's peculiar fancy for the phrase "hereditary mechanics" means that he has actually forsaken mechanical analysis. On the contrary, it is the mission of Volterra to save mechanics by showing that these hereditary effects vanish with time: the principle of the closed cycle is restored. That is, Volterra is demonstrating that after a lapse of time, a wire upon which we hang weights again satisfies Hooke's law.

<sup>&</sup>lt;sup>13</sup>Volterra, Fonctions de Lignes. See M. Winter's, "Time and Hereditary Mechanics", Monist, XXXV, pp. 70-80.

and ceases to exhibit "hereditary" phenomena. Eternal mechanism is assured if only the effects of the past will vanish. Yes, history is real only because we refuse to forget; life must end when the repetition of states becomes a universal fact. Thanks to the fact of unit characters (sublimated memory) plants and animals may evolve to a higher life. Paradoxically, we can only escape the past by remembering it, a truism not confined to Freudian psychology. Thanks to our conscious cultivation of history we may have progress instead of vegetative proliferation upon a given level. What could be more stupid than a universe which endlessly repeated its states, or the Hegelian "absolute", forever transfixed by its own profundity. Such a "world history" would read like Mark Twain's first diary, "Got up, washed, went to bed-got up, washed, went to bed." We maintain consciousness by shaking off habit, which seeks to engulf us in unconscious slumber. The structural and automatic side of our nature never quite succeeds in containing us, we are like vessels that are continually "boiling over". Our power of thus always slipping away from mechanization is projected as time, just as our power of motion is projected as space. When science denies the reality of future novelty, it not only flies in the face of logic, but goes entirely beyond its own requirements.14 James well observes that all that the scientist requires of the future, is not that all be given, but that nothing should be lacking. That is, the fact that science can predict that something will be true tomorrow, does not entitle him to say what else besides will be true. We can legitimately assume that the counted things are limited, not that the uncounted ones are.

This same incommensurability holds between present mechanical knowledge and the past. Poincaré raises the

<sup>14</sup> James, Wm., Some Problems of Philosophy, p. 162.

question, Have the laws of mechanics themselves evolved?15 He answers, if they have, we could never know it. For, we have only the present state of the world as a record of its past. Then, suppose that we reconstruct the world's past, by applying our present laws to the data of the world's present state. It is evident that we could never meet with a contradiction in making this reconstruction, provided that no disharmony existed between our present data and laws. Then, suppose that we find deep in the earth a geological condition which shows a past different from the one we have reconstructed? Will we conclude that the laws of mechanics have evolved, and that they were different in the past? No, for the scientist can always say that our present laws of mechanics are faulty, and must be modified to cover the new facts. This amounts to saving that scientific laws do not enable us to recover historical facts. It is just because a law applies equally well to a multitude of instances that it is impotent regarding the question as to which instance actually occurred. Newton's law of gravity will not tell us when the apple fell. Indeed, the strength of physical principles lies in their flexibility rather than their rigidity: their flexibility saves them from the possibility of contradiction. Suppose that vesterday two bars of hot iron were dropped in a vessel of water, and that today the temperature throughout is the same—say, 60 degrees C. Now there are an infinite number of possible temperatures of these bars which would give this present temperature, and to prove one "set" of such temperatures false could not effect thermodynamics. The only limitation of thermodynamics is that it cannot say, from the present state, what the original temperatures actually were—this is a fact of history.16

<sup>15</sup>Poincaré, Henri, Dernieres Pensees, p. 9.

of the degradation of energy (the tendency of all energies to change into heat and for heat to distribute itself uniformly) exhibits a deeply rooted tendency in the merely physical world to *eradicate its past*.

Harry Hollingworth<sup>17</sup> gives an admirably clear exposition of a certain fallacy which tempts all evolutionary reconstruction. We are led to imagine that because we have before us in the present a series of graded forms, increasing in complexity, that we may infer these to be stages in an evolutionary development. He illustrates the misuse of this device in the hands of Brentano, Stout, Kropotkin, Helmholtz, Wundt, and others. To suppose that the existence of a graded series proves that they shared a serial genesis in the past is a clear instance of the fallacy of affirming the consequent. If there is a fire, we may affirm that there will be heat, but not conversely (since heat may be due to friction). That is, we may affirm the antecedent, but not the consequent. Thus, if there is an actual historical record of evolution, we may affirm that there will be intermediate stages, but the (consequent) fact of intermediate stages does not justify the inference that they belong to the same genetic continuity. Again we arrive at the result that historical facts are open only to a unique method. This is what Simmel meant in the statement,18 "Law has an ideal character, no bridge leads from it to the tangible reality." The technique proper to historical research has long since been reduced to manual form, and is as much an accomplished fact as technique in other sciences.19

## TIT

The Positive Role of History: "Historical Synthesis"

The considerations just offered positively justify Windelband's distinction20 between sciences of law and sciences of events. The reality of time will not down-it rises again <sup>17</sup>Hollingworth, H., "The Logic of Intermediate Steps", J. of Phil., XXII,

<sup>18</sup> Simmel, G., Die Probleme der Geschichtsphilosophie, p. 42. Cf. Fling,

op. cit., p. 12. <sup>19</sup>Such as the work of Langlois and Seignobos, Ernst Bernheim, F. M.

Fling, and others.

20Windelband, W., Geschichte und Naturwissenschaft, pp. 16-19.

and again to verify a certain cryptic prophecy of Anaximander that "All things . . . . must render each other atonement and punishment for their offenses against the order of time."

Granting that history provides the raw materials for many of the social sciences, does it do anything else besides? Does it own any data except precarious and temporary "novelties", which are bound to become the data of science if they multiply? Wilhelm Dilthey21 declared that history, like our own lives, is not a means, but an end in itself. But, is the content of history an end in itself like the narrative story, which offers particulars as objects of idle curiosity? I propose to outline in this section a more fundamental role which history plays than the role of providing raw materials for sociology, or of offering to our minds, surfeited with the present, an escape to other times and places. History gives us values which are not subsumed under a law, but which may become goals of endeavor. We must distinguish sharply between a quantitative law, dependent on the frequency of its instances, and an ideal value, which, though not independent of experience, is yet independent of the amount of it, in the sense proposed by Driesch.

Thanks to innumerable observations Newton's law of gravity is true, but in the moral sphere one instance alone can generate belief. The one sacrifice of Christ for sin and the one sacrifice of Socrates for truth are examples. To be sure, both Christ and Socrates were followed by a multiplication of instances, but only because the first instance convinced. Indeed, one might extend this principle to the perceptual sphere in general. One perception of the color red would be more illuminating to a blind man than knowledge of a whole volume on color vision. It is notorious in scientific instruction that the student does not grasp the sig-

<sup>&</sup>lt;sup>21</sup>Dilthey, Wm., Einleitung in die Geisteswissenschaften, I, p. 114.

nificance of a physical law until he sees it demonstrateda laboratory demonstration is like a religious ritual from which we go with a form of enlightenment which only immediate experience can give.

We may state that the basic principle of history is the conservation of values, just as the law of the conservation of matter is the corner-stone of physical science. Physics posits the conservation of matter. So that if you lose a dollar, it is only lost to the "here and now"-you may be sure that it is conserved "somewhere" (though this is little comfort). Perhaps one significance of this principle lies in the fact that it saves the hope of recovering the dollar, somehow. Just so does history conserve as much variety of the "ways of life" as possible, so that any value (whether moral, aesthetic, or religious) may still be realized in the present. Thus, to the bulk of his contemporaries, Roger Bacon was a useless fool; yet, thanks to the fact that his doings were recorded, the present age has an example of one way of living which we would fain imitate. Even those who have defended the mechanistic conception have had something more ulterior in mind. Auguste Comte cherished empirical scientific laws above all else, but why? Because knowledge insured foreknowledge, but neither is foreknowledge his final goal. His formula is: "Knowledge, whence foreknowledge; foreknowledge, whence action."22 It is not true that Gabriel Tarde makes imitation the basis of our lives. We imitate not only our contemporaries, but men of the distant past, hence imitation is a potent action at a distance in time, it is "generation at a distance." The important thing is not imitation, but what is imitated, namely invention.23 Herodotus, the

<sup>&</sup>lt;sup>22</sup>Comte, A., Cours de Philosophie Positive, I, p. 63. Cited by Burr, G. L., Am. Hist. Rev., p. 270.

<sup>&</sup>lt;sup>23</sup>Tarde, Gabriel, Les Lois de l'Imitation, Eng. trans., p. 38. Cited by Burr. op. cit., p. 271.

father of history, wrestled history from poetry so that the achievements of men should not "fail of renown."24

Dr. F. M. Fling<sup>25</sup> clearly embodies the above conception of history in his endorsement and extension of Rickert's ideas. The object of history is to attain the individual and the unique. But the historian cannot record all unique things; he too must select. "We have to do here," he says, "with a question of value, with a standard." The historian "chooses from the endless number of individuals those that are valuable because they are unique, whose uniqueness is inseparable from their unity, and that thus have an importance because their loss or destruction would be irreparable."27 Note, that this does not assign to the historian the function of deciding what is valuable, and preserving records in accordance with these individual notions. The history of the reformation written by a Catholic could never agree with the record of the Protestant historian so long as they assume the role of moralists. But, if they proceed scientifically (i. e., if they confine themselves to recording the unique, from which all values are drawn), they will arrive at the same results. Nor does this imply that the unique is attained by omitting repeated phenomena; the unique includes repeated phenomena minus the repetitions. In short, like exact science, the data of the historian is dependent on experience, but unlike exact science, the data of history is independent of its frequency or amount

Since the historian ignores the aspect of the frequency of phenomena, he does not subsume his data under laws, but puts events together to form larger wholes. "The Protestant Reformation is intelligible only when treated as a part of that larger whole that embraces the entire reform

<sup>&</sup>lt;sup>24</sup>Burr, G. L., op. cit., p. 255.
<sup>25</sup>Fling, F. M., op. cit. I am throughout indebted to this article for citations and basic ideas.
<sup>26</sup>Fling, F. M., op. cit., p. 14.
<sup>27</sup>Fling, F. M., op. cit., p. 14.

movement in the Latin church in the fourteenth, fifteenth, and sixteenth centuries; again, the history of the Reformation as a whole must be treated as a part of the whole history of the church, embracing the Eastern and Western churches, or it may be looked upon as a part of the historical life of Europe."<sup>28</sup>

The peculiar advantage of the logic of synthesizing parts into wholes (as opposed to subsuming particulars under a law) is that it enables us to preserve the individuality and uniqueness of the parts. This form of synthesis is asserting itself at present in the sphere of psychology as it is championed by the Gestalt school. Fling illustrates its use in various ways. It permits a sharp separation between the work of the sociologist and the work of the historian. "What Luther has in common with other Germans might be important for the sociologist; it would not be for the historian. It was just the thing that was unique in Luther, that distinguished him from other Germans, that rendered him important for the Reformation and for the whole subsequent life of Germany, that makes him an historical character."29 These statements are true, for had Luther been like other Germans, there would have been no Reformation. This is not gainsaid by supposing that another individual might have done the same thing: he would not have been Luther in name (there is nothing in a name) but he would have owned all of Luther's uniqueness. Nor can escape be sought in the statement that the Reformation would have failed if there had not been many "like Luther" to imitate him: Tarde's distinction between invention and imitation saves the difference.

## TV

# Conclusions

It is not, then, that science and history oppose each

<sup>&</sup>lt;sup>28</sup>Fling, op. cit., p. 15. <sup>29</sup>Fling, op. cit., p. 16.

other. They offer us two accounts which are equally true, but different truths. Should we then speak of the historical and the mechanical "points of view"? But, two points of view are presumably of the "same" reality. I rather incline to think that the opposed accounts of history and mechanics are accounts of opposed realities. One is the science of the inert, the other is the science of life, and between inertia and life no common denominator exists that I am aware of. There may indeed be eternal conservation in the sphere of physical matter, whose being is somehow "guaranteed". But there is a sphere of spirit and value over whose concrete existence hangs, not an axiom, but an ever-pending question, "To be, or not to be?" To record the waxings and wanings of this reality is the function of history, which gives us, not formulae, but a timeful drama.

This is opposed to the view of idealists among philosophers who assume a vantage ground from which this dramatic time order will resolve itself into an eternally present and absolute reality. Thus, Aliotta<sup>30</sup> declared, that "to a thought taking in at once all the universal and special determinations in the single fact, there would be . . . only philosophy, which would also have the concreteness of history." We can only assent—provided there *exists* such an all-embracing thought. Perhaps God has it, but that is God's enlightenment, not ours.

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<sup>30</sup> Aliotta, Antonio, The Idealistic Reaction Against Science, Eng. trans., p. 445.

## **EVOLUTION OF RELATIVITY**

A LTHOUGH I am not writing in Tennessee, I should explain my heterodox subject. While I believe that all becoming, all change, is a real evolution in the relativity of things, here I mean by evolution merely an orthodox process of unnatural selection by which human understanding has arrived at its present concept or attitude of relativity. I mean by relativity—and, please, will no one suggest to a Southern legislator that the last word of my subject is more devilish than the first—relativity in its most fundamental and general sense, relativity as a characteristic and constituent of the real. Man's appreciation of this characteristic has been an evolution.

By relativity I do not mean relativism or subjectivism, which words are vitiated by dualistic and absolutistic assumptions. Relativity is the state or, more often, process of differentiating, of making a difference. In the absence of relativity no differentiation can exist, nothing but an infinite, continuous uniformity which is identical with non-being. I repeat, where no difference is, nothing is; where difference is, there something is, and that something is relative. It is relative in that it owes its very existence and nature to the relations it shares with other things. If it has extension, duration, or motion, feeling, thought, or meaning, or any other characteristic, even existence, it has each and all in virtue of its relations with something else. For what is absolute being, or being with respect to itself?

Even nothingness, from its own point of view, has being. When clearly conceived, space without differentiation, or absolute space, is simply nothing. Likewise, absolute time, substance, spirit are severally and, therefore, collectively nothing. But given differentiation or relations, then time, space, motion, and even spirit are also given. Spirit or mind is a matter of degree, manifesting itself in proportion to the complexity and internality of relations. Individuation consists in relative differentiation of relational configurations.

Only space can differ from time, and only time from space. Time is differentiated space, and space is differentiated time. Space-time is, from different points of view, relative motion, energy, process, perception, appreciation, thought, creativity. This is not a genetic description. Since the process of reality constitutes time, these attributes of the real have always existed, and the real has always been a complex organizing and creating of relations. Like the checkerboard, or better, because of its greater complexity, like the game of chess, these fundamental relations must obey certain unalterable laws, but they also have an indefinite range of possibility, opportunity for purpose and error, and capacity for failure or success. From the point of view of science we have discovered within this relational process a few laws of combination which are very probably. for the present at least, quite deterministic. From the point of view of certain complex portions of this process such as, for instance, finite minds, when these portions or minds function not merely analytically, but also with immediate synthesis as in sensation, appreciation, or intuition, we discover within reality quality, purpose, consciousness. In brief, the logically fundamental metaphysical unit is a spacio-temporal differentiation or relation which, while continuous with other relations, has a geographical, historical, and configurative individuality. Being spaciotemporal, these relations necessarily consist of motion and, therefore, manifest energy. And relative motion which is of such sort as to constitute space-time, must be vital. I mean by this that it manifests order, consistent change, appreciation, creativity. This process has its deterministic, quantitative characteristics, and also its purposive, appreciative capacities. From many standpoints it is material; from many others it is spiritual; from others equally significant it is neither or both. At least logic and science, introspection and intuition, have enabled us to see from various vantage points this infinitely complex process of which we are intimate parts. To this synthetic view of the nature of reality and knowledge the evolution of the concept of relativity has brought us.

From the metaphysical point of view the chief forms of relativity which appear in the history of the concept may be described semi-symbolically as follows:

Let R mean *making a difference to* or *in*, and let *a* and *b* mean objects or terms of any sort. Then:

Configurational Relativity is  $\mathbb{R}^n$ , e. g. any complex set of relations, any object a or b, such as a crystal, tree, personality, quality or concept.

Simple Relativity is a-R-b, e. g. sun-R-solar system. This is the form of psychological subjectivism and the theories of a non-absolute creator-god.

Mutual Relativity is *a*-R-*b* and *b*-R-*a*, e. g. individual-R-society and society-R-individual. Leibnitzian monadology and socialism exemplify this type.

Absolute Relativity is R<sup>n</sup>-R-R<sup>n</sup>, e. g. the state, such as the electro-magnetic field or the human mind, in which nothing exists but relations and relative configurations of relations. This characterizes reality as I conceive it, and also, I believe, as Professor A. N. Whitehead, perhaps less absolutely, would hold.

Particularly Limited Relativity is a-R-b but not b-R-a,

e. g. seal-R-impression but not impression-R-seal. This is distinguished from Simple Relativity by its emphasis upon the asymmetrical character of the relation. It is limited because the relation is significantly internal to only one term; and it is particular because all the relations sustained by the other term are not external. Kant's categories and Plato's ideas represent this type of relativity.

Universally Limited Relativity is a-R-b but not b-R-a, and for every value of x, it is false that x-R-a, e. g. where a is the Absolute upon which all else depends but which itself is independent or unaffected by anything. This type includes the Indian Brahman and the absolute of Plotinus.

Selective Relativity is *a*-R-some *b*, e. g. sense of sight-R-some light rays. Here Kantian epistemology and specific methods, such as the scientific and the mystical, are typical.

These forms of Metaphysical Relativity, i. e., relativity in the nature of the real or being, have corresponding forms of Epistemological Relativity because experience or knowledge is just as real, and just the same sort of reality, as anything else. With respect to the relations between the so-called metaphysical and epistemological realms, simple relativity may be called Mediary Relativity, a-R-b where a is some medium, such as air or light rays. between the knower and the known, and b is the resultant knowledge. Mediary relativity has the forms of Physiological Relativity where a is part of the knower's body; Psychological Relativity where a is the nature of the mind; Pragmatic Relativity where a is the interests, desires, temperament of the knower; and Historical Relativity where a is tradition, education, the political and economic conditions, and such factors of historical epochs as influence judgment or appreciation. This classification is, of course, more or less arbitrary, and itself relative.

Chronologically, the absolutistic attitude precedes the relativistic. Primitive man, who represents a stage in human evolution including, according to future historians, the twentieth century, seems naturally inclined to absolute explanations. Largely because of his desire to utilize the beneficent, and placate the malevolent, forces about him, man has been so eager for absolute knowledge that often he has almost deliberately deceived himself into believing he possessed it. Even the civilized man can refuse to look through the telescope for fear his faith may be shaken. Negative instances are notoriously difficult of observa-The Vedic sacrifice is master even of the god of thunder; and if one tithes and sits in the pew on Sunday, one fears not death. Moreover, the definiteness and convenience of the simple, unconditioned explanation favors the absolutist tendency. Man's limited experience and his insensibility to the infinite complexity of fine distinctions led him to consider absolute the aspect of things as seen from his usual point of view. The earth is flat, for we have seen it so with our own eyes. The fundamental substance is water, or air, or spirit, or electricity. One can see that Euclidean geometry alone is valid. The earth is at rest; no, it moves and the stars stand still;—well, you can take vour choice! Thus, seeing things in an increasing variety of aspects or relations has changed our judgments and heightened our sense of the dependence of our judgment upon our particular point of view. All viciousness or subjectivity in this conception of relativity is circumvented by the denial of any substantial distinction between the subject and the object, by the recognition that particular points of view are just as spacio-temporal and just as spiritual when they are our own as when they are the moon's.

The pre-Socratic hylozoists and the unsophisticated Sophists, with their helmsman in Heraclitus, started phil-

osophy on a tack which might have kept Western culture out of the doldroms in which it drifted for two thousand years had not Socrates and Plato brought about a calm so absolute that even Aristotle could not keep his sails inflated. The Milesian school explained reality equally well by taking as their point of reference any stage of the world-process such as water, air, or the boundless. In terms of this more or less arbitrarily chosen absolute all else had its being and could be known. Like Thales, Pythagoras, too, was more relative than he knew, for before Einstein the Pythagoreans "put the world in numbers." The anti-anthropomorphism of Xenophanes, the fiery flux of Heraclitus, and the manmeasure doctrine of Protagoras proved too much for the traditional absolutism which, with respect to religion, morality, and the state, would let well-enough alone. Instead of accepting relativity and beginning a collection and classification of aspects, Socrates and Plato soared into the heavens in quest of an absolute pattern for the whole, and the parts, of a perfect and unchanging city-state. They graciously granted Heraclitus his flux. Things are changing and relative, but things are imperfect and lacking in reality. Just here Aristotle almost saw that ships could sail in spite of Platonic calms. Nothing for him was more real than the particulars; their perfection was relative to the unique potentialities which resided in the nature of each. Your Golden Mean could not be mine. Matter and form, even primitive matter and pure form, potentiality and actuality, non-being and being, like genus and species, are instances of mutual relativity. In the first pages of the De Motu Animalium, chiefly, the assumption that only the immovable could create movement kept him from the conception of the relativity of motion. Yet Aristotle had spent too many years in the Academy not to finish by assuming an unmoved mover and the immortality of species. The attention was again shifted from identities to differences by the Cyrenaics, whose psychological and epistemological relativity was continued by the Epicureans. Yet, as in all of these early relativistic views, something like the Epicurean atoms forms a background of absolutistic assumptions. This fact is implied by the very name of the last representatives of this tendency in Greek thought, the Sceptics. It is latent in the concept of probability as developed by Carneades. The Sceptics of the first century of the Christian era contributed to the evolution of relativity by arguing that a cause is a relatum which can neither be syncronous with, nor precede or follow, the effect. Here the argument waited for David Hume. In passing, one may remember the beautiful characters of Arcesilaus and Carneades, a consequence, perhaps, of their philosophy.

Throughout the Middle Ages the concept of relativity awaited the conquering of the unexperienced minds of Western Europe by the centered might of Christian and Platonic absolutism. The relativistic attitude, however, was never entirely absent. Even mysticism has more significance here than appears at first sight. It bears witness for relativity not only negatively in the extent of the world against which it turns its back, and in its opposition to the formulated dogmatism of the period, but also positively in its ready acceptance, as Hocking expresses it, of "a present inspiration as its law." Among the intellectuals this same tendency was kept alive by the growing emphasis upon nominalism. The conception of the relativity of perception and of knowledge was chiefly responsible for the new view of the world created by such minds as Nicolaus of Cusa, Copernicus and Giordano Bruno. Burnt offerings of living men were sacrificed on the altar of the absolute that a Galileo, a Kepler, and a Newton might live and think. Here at the dawn of science the evolution of rela-

<sup>&</sup>lt;sup>1</sup>The Meaning of God in Human Experience, New Haven, 1923, p. 400.

tivity was rapid, and culminated in Newton's formulation of the relativity of motion. Yet even Newton was unable to trust his insight, and postulated absolute space, time, and motion. He showed, however, that the followers of a creative mind may be more dogmatic than their master. Newton said that he was only like a boy playing on the seashore, and diverting himself in now and then finding a smoother pebble or a prettier shell than ordinary, while the great ocean of truth lay all before him.<sup>2</sup> And Einstein, making a substitution for Descartes's name in another of Newton's remarks, might say, "If I have seen farther than Newton, it is by standing on the shoulders of giants."

Here I can but mention the steps in the evolution of relativity through the dogmatic abduction of the scientific methods by Descartes, Spinoza, and Leibnitz; through English empiricism and scepticism with its almost complete emancipation from religious absolutism; through German criticism and idealism with its reserve strategy making the last stand against the allied relativistic forces of individualism, positivistic philosophy, psychology, and science; the pragmatic and neo-realistic attitudes of mind; and the development of mathematical theory and scientific experimentation, particularly non-Euclidean geometries and electro-magnetic and optical hypotheses.

In science the flower of this evolutionary growth is the theories of Einstein. Einstein's accomplishment is chiefly a synthesis of the results of many different fields of investigation. It deserves the name of physical relativity because of the fundamental role played by the mutual relativity of time and space and the absolute relativity of motion. This is a physical and metaphysical relativity because the real nature of things or events varies with their

<sup>&</sup>lt;sup>2</sup>Cf. W. T. Sedgwick and H. W. Tyler, A Short History of Science, New York, 1917, p. 300.

<sup>3</sup>Loc. cit.

relations. Einstein's frequent mention of the observer's point of view has led to a confusion of relativity with subjectivity; but in every case the observer could be replaced by some other recording instrument. Moreover, for Einstein the observer, even in a psychological sense, does not necessarily differ in kind from other parts of the spacetime continuum. Mind, like matter, is space-time or nothing. From certain points of view, however, his whole position is characterized by a selective relativity. It is relative in fact, if not in form, to the highest velocity we know, that of light. It is relative inevitably to the fact that our observations must be made on, and from, the Earth. But of still greater significance for philosophy, the Einsteinian view of the world, like the behavioristic view of the soul, is relative to the mathematical or measuring approach of science. From these points of view the theory of physical relativity probably presents an approximately accurate description of an important aspect of reality.

We seem to be ready for a thoroughly relativistic philosophy. Reality is a complex of relations. Entities are relational configurations whose nature and boundaries are relative to the point of view. Such reality and such entities exhibit permanent quantitative characteristics. They exhibit also creativity, originality, development, design. This aspect is most evident to introspection and intuition, which relationships are no more psychological than metaphysical. Knowledge is not a function peculiar to that portion of reality we call human, although man most readily recognizes it himself and in other entities which his crude senses represent as most analogous to himself. Receptive knowledge is taking account of the differentiations in one's environment in such a way as to retain a corresponding set of differentiations within one's own complex of relations. In this way both quantity and quality consist of relations. The most evidently relative are the so-called primary qualities. This is indicated by the inconceivable example of a universal uniform variation. It is said that if absolutely all velocities were suddenly reduced to half their present rate, or all things to half their present size, we should never know the difference. They say truly, for there would be no difference. Such a uniform variation is no variation at all. Likewise, the secondary qualities are but systems of differentiation. If your perceived colorscheme varies systematically from mine, it does not vary at all. Yet qualities of this sort, which are introspective appreciations, cannot be reduced to quantity, although the same set of relations seen from a different point of view and in a somewhat different total situation, appears as quantity. The validity of the qualitative aspect is suggested by the fact that all the wisdom which the method of physics and behaviorism can acquire, can be communicated entire to the congenitally blind man, but can never enable him to understand or appreciate the quality red. The colors correspond to differentiations in certain complex situations which include eyes. The epistemological significance lies in the theory that the system or form of the relations or differentiations constitutes quality. Except for other relative considerations, such as empathy. the Venus of Melos is just as beautiful in statuette as in heroic size—it is her form that counts

I shall neglect a consideration of the relativity of value for a final observation concerning the value of relativity. First, with respect to accuracy. If Ptolemy, Copernicus, and Einstein each had said, "Relative to my point of view, to the data at my disposal, the most probable explanation of the world is the following," each would have spoken an eternal verity. Moreover, that attitude would have discouraged their disciples from burning at the stake those who would bring forward new data. The relativistic spirit is death to censoriousness, dogmatism, and such sectarian-

ism as is seen in religion and psychology today and in the way many scientists accept or reject Einstein. In ethics and religion, for how many millions of the most enlightened lives must absolutism answer! Without the support of the absolutistic attitude of mind, crusades, holy wars, inquisitions, and pogroms would at least have caused conscientious hesitation on the part of their devoutly sincere perpetrators. Nothing is more encouraging for fanaticism, or more discouraging for sustained effort, than so-called absolute ideals, which, for all their dialectical and revelational justification, are intuitively known to be unattainable, and somehow untrue of the real world. The result is jugglery in the moral life, or a consistency which is worse because sanctioned by fear which is maintained by an ignorance enforced at the hands of absolutism. Relativity goes forward with the conviction that the relative ideals of the present are attainable at least in that part of their essence which requires that they shall change and develop with increasing experience and knowledge. Relativity says that no ideal that can be known in the present is good enough for the future. Moreover, my ideal is never good enough for another man. This all means that collectively and individually we must help discover our own ideals, and, because they are relative, act vigorously upon them in order that their relativity may become more and more inclusive, true of more and more reality, ever adapting them to the actual situations of which they must form parts.

In this day, when no man can take all learning for his province, cooperation, the sharing of points of view, is necessary for progress. Since things are essentially relative, the best policy is to see a thing in as many of its relations as possible. In philosophy the absolute played the vicious role of the lotus, lulling to sleep in a dreamy nothingness those who might have been courageous searchers for new points of view. In science the absolute has, for

the same reason, delayed discoveries for centuries. Once the earth was believed flat or at rest, man could be roused from his lethargy only by the dogged insistence of circumstance in the form of a few men who for truth's sake would risk the absolute's hell.

The relativistic attitude does not lead to scepticism. The relativist knows that only by action on the basis of present knowledge, with a full awareness of its relative character, will he discover new facts, and arrive at more comprehensive, and therefore more useful, generalizations. The believer in the absolute hesitates to act from fear of his having failed to comprehend the absolute. The relativist knows that there is no awful absolute; knows that action must be based upon the relative; knows that the world is an inexhaustible stream of increasingly interesting relations which will blend each individual personality in an ever greater harmony with other personalities and the rest of reality.

"New times demand new measures and new men;
The world advances, and in time outgrows
The laws that in our fathers' day were best;
And doubtless, after us, some purer scheme
Will be shaped out by wiser ones than we,
Made wiser by the steady growth of truth."

—Lowell.

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## HEGEL AND FREUD

Ι

THE unconscious self is postulated by Freud and is an integral element in his psychology, but it seems to me to be a contradiction in terms. It may therefore be worth while to attempt to find a substitute. Such a term must be valid, and, if Freud's system is a complete system, it must be demanded by the other terms which constitute the system.

Certain determinations of the mind are said to arise out of the Unconscious and again to be repressed into it when the historical description of the event would be "there was not, but now is" and "there was, but now is not." The Unconscious is that into which these determinations sink, and out of which they arise. Further, "the Unconscious" means, I think, a collection of unconscious states so that Freud is not involved in the fallacy of positing a form which is nothing except the totality of its content. But if he succeeds in avoiding this fallacy the alternative is that he must predicate something of the unconscious states and this is impossible, for a state of the mind can be experienced only by the conscious mind, or, rather, is a modification of consciousness. What has been said in this paragraph is not designed to be additional proof of the invalidity of "unconscious self": it is intended to make more acceptable the proposition that "we must predicate Nothing of the unconscious self" and thereby to indicate

a similarity between a part of Freud's system and the be-

ginning of Hegel's.

This similarity becomes significant if it can be shown that the phenomena from which Freud deduces the existence of a subconscious self are proper to a state of mind which can be described by saying that the mind is in a low category; what is meant by this is that the category is lower than that in which the mind is whenever it has normal, workaday consciousness; and by category is meant a state of mind in which it is so related to the external (together with which it forms a system) as to be aware of it as a collection of a particular kind of terms related in a particular manner; each category has a peculiar set of terms having a peculiar relation. "Category" is here used, I think, as Hegel uses it, except that it has a subjective element, which is involved by the nature of the question. It must now be shown that the phenomena just mentioned are, in fact, phenomena in the mind when it is in a low categorv.

Among these Freud discusses errors in speech—substitutions of wrong words, and the like. It is difficult to account for any error, unless it is believed that the mind can operate capriciously; and capricious action is incompatible with the nature of mind, which is to understand: how only that is intelligible to which a rule, or something analogous, can be applied; and a rule cannot be applied capriciously. But the phenomenon of error exists and must be accounted for; and, since it cannot be merely meaningless, it must be allowed to have some significance. If, where A is demanded, A' is said, there is some relation of similarity between A and A'; they are similar in sound, or at any rate, each is a word, a unified group of syllables. If this similarity could be changed into identity the substitution would be accounted for; and this identity does. in fact, exist for a mind to which neither A nor A' is a word

in the sentence which it was expressing, but is a term in some system other than the sentence. It is a system in which the mind adequately expresses itself in mere vowels, or in mere Somethings whose characteristic is that each is none of the others. Now such a system (or category) is manifestly lower than that in which the mind is when it expresses itself in the sentence in which the error was assumed to be made; for (to touch the first example only) a word is richer than a vowel to which the consonants are irrelevant. So that when an error is made the mind passes into a lower category, and the error is the manifestation of the presence of two categories in one unit of experience. The subjective cause of this relapse is neglect of intellectual effort or "concentration": but it must be admitted that it is still not clear how such a negation of intelligence can arise in intellect.

Another error which Freud mentions is "compensation." After A' has been pronounced where A was required, an attempt is made to retrieve this error by substituting B' for B; the terms denoted by these letters may be either words, syllables or letters. Such a rectification is permissible in a category where the totality is the sum of its terms, and no more, and the validity of each term is not affected by its position, so that the category is a quantitative category. But the elements of a sentence are richer, each having significance by itself and also being in a relation of reciprocal determination to the other elements and to the whole; the category in which the mind is able satisfactorily to retrieve error by "compensation—that is, to perceive no error in a system governed by "compensation"-is, therefore, a lower category than that in which it is when it expresses itself in a grammatical sentence. It is unnecessary to assume any unconscious awareness which causes rectification by "compensation," and the correct statement of this event is, I think, that the mind

operates, at the moment, in a certain (and lower) category. The nature of the terms of a category, and their relation to one another is partially preestablished, since every category is an approximation to Reality and must therefore have the quality of coherence and completeness; it is therefore impossible to assume that the mind should modify the terms of a category once the category is given. But it is possible that mind should be in one category and again in another, and that these transitions should be quick and irregular.

It might appear that errors like consistent forgetting could not be explained except by the assumption of a permanent unconscious force operating to prevent the action, which is frustrated by being forgotten. An example which Freud quotes with approval<sup>1</sup> refutes this view. E. Jones (who did not wish a certain letter to reach its destination) forgot, first to post it, then to address it and (upon its return from the dead letter office) to frank it. But an unfranked letter will fail to be opened by the addressee only if he refuses to pay the postage and charge. The definition of E. Jones' three omissions as manifestations of a force which would prevent the letter from being delivered is, therefore, incorrect. But they are correctly defined as omissions of ordinary procedure with regard to letters. Such omissions are commonly called acts of forgetfulness and are due to failure to concentrate (as the metaphor goes) upon the object. The despatching of a letter is a system of which (among others) the addressing, posting, and franking are the terms; each of these therefore logically implies the next, which implication manifests itself empirically as a remembering of acts suggested to itself by the mind as to be done. If a term is forgotten, the cause must be that the system as a whole was not understood with sufficient accuracy by the mind at the time when the mind

<sup>&</sup>lt;sup>1</sup>Vorlesungen, p. 51.

was engaged upon it; and this inadequate understanding may very well have been caused by a contradiction between purpose and desire, so that Freud's inference from the observed facts is correct, although his reasoning is incorrect. Term A does not lead up to term B, not because there is an unconscious force operating to inhibit B, but because A appears not to imply B; the process is a logical process manifested temporally, and the relation between the terms which forces them to arise in turn is logical and not temporal.

It is less easy to give an account of dreams than of errors or "compensations." It will be most convenient to treat separately the interpretation which the dreaming mind applies to sense-data, and the processes of thought within it; these two classes of mental experience correspond respectively to the processes of observation and of reasoning in the waking mind.

With regard to the first class Mr. Bertrand Russell sums up the matter thus: "Dream-data are no doubt appearances of 'things', but not of such 'things' as the dreamer supposes."2 And it may not be out of place here to quote a remark from Heine<sup>3</sup> which he made in the year 1828. "The same thing happens to poets as to dreamers, who so to speak mask the internal sensation which their soul experiences from real external causes: in their dream they substitute for the latter wholly different causes which however are quite adequate in so far as they produce the same sensation." Both authorities assume that there are 'things' or 'real external causes' which are misinterpreted by the dreamer; and it sems to follow that, if he were awake, he would interpret them correctly or in a more correct manner. But it seems that the perception of a thing also implies a theory about that thing; or rather, that there

<sup>&</sup>lt;sup>2</sup>Sense-data and Physics, XII ad fin.

<sup>&</sup>lt;sup>3</sup>Translated from Reise von München nach Genua, ed. 1861, p. 37.

is a relation of reciprocal modification between the thing and its interpretation. A patch of colour may be perceived as merely "white" and interpreted as "this white patch"; or it may be perceived (in a more developed manner) as "white, plastic and gleaming", and interpreted as "snow". Now the adult mind in its ordinary workings operates in such a manner as to perceive such data as do not appear to be in need of the kind of development which has just been mentioned; it operates in categories which appear to it to be adequate; this is the result of past experience (which term includes education); and the inadequacy of the data and of the descriptions of and assumptions about reality which they imply are only perceived by few, who, being led to further thought, come to have more valid perceptions as artists or, as philosophers, to hold sounder views about reality. If this statement is correct, then the relation between the mind of the artist or the philosopher and the ordinary mind is similar to that between the latter and the dreaming mind; and this relation is expressed when it is said that those three states of mind are three categories, each of which is higher than that which (in the order here given) follows it.

Freud is not greatly interested in the relation between the dreaming mind and the external world. He presumably believes that there is a fixed external world of realities which the dreamer merely misinterprets; and in this process the unconscious self cannot easily be given a significant function. He therefore concentrates upon the images which arise in dreams without any obvious connection with sense-data; and it is easy to make the unconscious mind the cause of these. If this satisfies his practical needs it is adequate; but systematically it is unsound; and it is more satisfactory to have shown what is the relation between the dreaming mind and sense-data and now to proceed to show

that the relation between the dreaming mind and dreaminages is a similar relation.

Freud does not assign a single origin to all dream-images; he admits that some may be "day-renmants". But this class of dream-images has no place in his theory; the practice of his theory depends upon those dream-images which are symbols, and, since Freud's end is practical, he has a right to neglect the first class, as he does.

Where a symbol A' is used to symbolize a concept A, there must be some similarity between A' and A, otherwise it would be impossible to know that A' is the symbol of A; and there must be a difference, else A' would not be a symbol and would be identical with A. Now A (by hypothesis) is a concept valid for the ordinary operations of the waking mind; therefore the content of A', in so far as it differs from A, must be irrelevant; it is a matter which exists but equally might not exist, or might be different. And in fact many examples can be taken from Freud in each of which the same concept is symbolized in a different manner; so that some of his critics assert that any symbol whatsoever may be held to symbolize one single concept. Now it is clear that a category, where part of the content of the concepts with which it operates is indifferent, is inferior to a category, where the whole of the content of the concepts is indispensible; therefore the mind when it forms or is visited by dream-images is in a lower category than that in which it is when it operates with the concepts which the dream-images symbolize.

It has now been established that many of those mental phenomena in which Freud supposes the unconscious self to manifest itself are correctly described as phenomena appearing in the mind operating in a relatively low category.

41t is not, of course, asserted that the sleeping mind is always in a low category. Not all its operations are dreams; but some (as where a Latin verse is constructed, or a chess problem solved, and this is known to have happened)

But it is certain (if a layman can be allowed to judge) that these phenomena are significant and that their significance eludes the description which has just been mentioned, while they become significant at once if Freud's view is admitted. It is therefore necessary to add to this description this, that they are phenomena from which correct deductions about certain past mental experiences may be made, but that they must not be made on the assumption of the existence of an unconscious self. It must, then, be shown how else it is possible that these correct deductions can be made.

What caused Freud to construct a subconscious self was the stability of that something (the Repression) to which these phenomena are observed to lead: as a container for the temporally persisting Repression he constructed the subconscious self. As a construction the subconscious self is invalid because (as has been pointed out already) it is a contradiction in terms; as an inference, neither it nor any temporally persisting entity is demanded by the facts. The facts (a recurrent series of symbols) merely warrant the inference that a certain event (the Repression) did at one time take place. And since this event does not perpetuate itself chronologically the suggestion may be entertained that it perpetuates itself logically.<sup>5</sup> Let it be assumed that a logical process has been broken off at the Repression; then (1) it will be an eternal fact that this break has occurred, although the break does not persist eternally; and (2) the mind may be caused to revert to the last term of the logical process because such a process contains a necessity of completing itself. Only in this sense the past fact is still operative.

are the operations of ordinary consciousness; and some dreams bring experiences which seem to have so profound a significance that they appear to deserve to rank above ordinary consciousness.

<sup>&</sup>lt;sup>5</sup>It will appear in the second half of this paper that the persistence of the past in the present is of the greatest importance in giving a meaning to experience.

If this is correct, the following account may now be given. When a Repression takes place the mind refuses to admit the final term of a logical process and asserts that it must be neglected, which is contradictory. This false assertion can only be upheld by an effort, and when (as in sleep) the effort is relaxed the immanent logic which subtends mental events causes the incomplete process to be presented to the mind once more. It has been explained that a dream is not a disguise or distortion, but merely a representation proper to a low category. It remains now to show in what sense the processes which have been discussed are logical.

It has already been shown by examples that some mental processes are from category to category. I now suggest that all mental processes take place in this manner; and I assume that the presuppositions of the Hegelian dialectic are substantially correct. Hence the mind must always be in some category, and, as soon as it reflects upon the data of that category, must engage in a dialectic process (which has been called logical hitherto) until a (subjectively) satisfactory end is reached or else the process is wilfully broken off; it is not suggested that the objectively satisfactory end is often reached. An answer to the pertinent question why the subjective and the objective ends do not invariably coincide cannot here be furnished; such an answer would also imply an account of the origins of error and of evil; and it is doubtful whether a satisfactory account of these two problems has ever been rendered.

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Up to this point the experiences of the mind in lower categories than that of ordinary consciousness have been considered. Next there are to be considered those mental contradictions and troubles the effects of which can be observed in these categories, their cure by means of a logical

synthesis, and the progress of the mind to higher categories in sublimation.

Those troubles which Freud considers are neuroses: the circumstances in which they arise seem (from his examples) to be such that the mind, being confronted with a problem, fails to attain a correct solution; it makes a mere barren negation of the facts, and this denial vitiates whatever experiences arise from them. Freud, borrowing his metaphor from dynamics, gives the name of Repression to this negation; and it must not be forgotten that the process of repressing is partly at least affected by the will. But will, although it is the immediate cause of conduct, is not its ultimate cause: I think that, before will can act to repress, the mind must have acquiesced to an attitude in which it allows truth to a state of facts which it knows to be untrue. If this view is correct, Repression is due to an intellectual lie; but if not, and if will operates as prime cause, then will, as the phrase goes, acts a lie.

Freud<sup>6</sup> relates the genesis of a neurosis which, if examined, shows how bare negation of facts leads to the disease and how no medicine can be found until a regress has been made to the beginning of the trouble. An elderly married lady fell in love with her son-in-law. In order to justify this love, which she believed to be monstrous, she attempted to bring about a state of affairs (through an anonymous letter) in which she might have reason to believe her husband unfaithful. She developed a jealousymania which Freud was asked to cure.

The problem with which she was faced was, in the beginning, a conflict between her love and her duty. Reconciliation might have been found either by the justification of her love, or by its subordination to a system which was acknowledged superior to personal happiness. But no attempt was made to find such a reconciliation; and the need

<sup>&</sup>lt;sup>6</sup>Vorlesungen, pp. 277-283.

for some solution still persisted. It was supplied by a fiction, the unfaithfulness of her husband, which was no justification, but only compensation. Now, since this solution was a fiction, it could not be disproved by facts; and, if it had seemed to be disproved by facts, its place would have been taken by another fiction, and must have been so taken. For, had any fiction allowed her happiness, then it would no longer have been fulfilling its function, since the function of the fiction was to supply a sorrow which should justify her wrongful conduct. Having relapsed into happiness she would have been forced to find another fiction and so to infinity. It will be seen that the whole process follows from an untruth, which in turn follows from a refusal to face a problem by itself and without the help of a compensating element from outside.

It appears then that the denial was the first term of a series of actions which followed from it. The mind of the patient had entered a system in which jealousy of her husband was a necessary element. Knowing that her servant was jealous of another woman and willing to harm her, she suggested to the former that she could have no greater grief than to have cause for jealousy of her husband. The result was that the servant forged such a letter as would give such cause, in which the name of her enemy was mentioned. This course of action taken by the lady Freud describes as the operation of her unconscious self. The correct explanation seems to be this, that the first term, the denial, implied further terms; (the hypothesis of infidelity demanded proofs): the connection between the terms is thus logical. It is unnecessary to assume that the intervals between terms in such a series are filled with subconscious mental operations. The transition from one term to the next in every series must be immediate; the opposite assumption involves a vicious infinite series. The intervals between terms of any series contain terms of other

series. The view which is being opposed to Freud's is, then, that the Repression (or untruth) is present in its later manifestations only as a cause is present in its effects; and it is denied that, having persisted in an unconscious self, its manifestations are emergences of it into consciousness.

This account may be criticized on the ground that it does not explain why the cause of the neurosis invariably escapes the consciousness of the patient. The explanation which the argument seems to demand is that which follows. The mind makes the original denial, not unconsciously, but also without having the conflicting terms presented to it in their explicitness; the neurosis could not arise if the conflicting elements were developed into a high category and were scrutinized by the full powers of intellect. But the regress from ordinary consciousness to those lower categories is not purely logical or one which can (in practice) be followed without the help of contingency. This is one difficulty which baulks the attempt to remember the origin of a neurosis. And, next, the denial itself is contradictory, since it is both the recognition of a fact and the refusal to admit it; it cannot therefore be fully understood by intelligence until it is analysed, and it is assumed that this has not happened where a neurosis occurs. And, since the fact has not been fully understood, it also cannot be remembered. For individual experience proves, I think, that only that can be remembered which appears to have significance in itself, or by virtue of the relation which it has to other members of a system (which may be experienced as having duration, or otherwise) of which it is a member. Now that which is not understood cannot be significant.

The cure of neurosis is attempted by analysis, a process by which a regress to the original flaw is effected. I am not acquainted with the technique of analysis; from Freud's account it seems to be a treatment of the mind by which it is allowed free play in the hope that in this freedom it may furnish some clue to the secret of its unconscious. If the criticism which was previously made of Freud's psychology was correct, this may be interpreted in the following manner: the mind is allowed freely to lapse into lower categories in some of which it had begun but not completed intellectual progresses. As the mind reaches any category in which this happened, it must resume the progress. (Such progresses need not be of dialectical nature, that is, from lower to higher category; they may be a movement from one term to another in the same category.) Thus, guided or unguided, the mind may reach the category in which the origin of the neurosis lay. If this category is known to the healer, then the terms with which the mind operates in it can be stripped of what is irrelevant to them so long as they are treated as terms of a higher category ("the symbols are interpreted"); and from them that part of the category which is looked for, namely, the cause of the neurosis, may be inferred.

When that category has been reached in which the neurosis occurs the search for its beginning is made in a manner which probably is strictly scientific. It seems justifiable to assume that, in a category where the discovery is reached by a series of words one of which suggests the next, there the words are related in such a manner that one logically implies the next; but I do not think that this can be demonstrated, since logical implication in a low category relates poorer terms, and relates them in a less valid manner, than does logical implication in a high category; and, although it may be possible to give formal descriptions of low categories, it seems impossible fully to account for their content. The patient does not know in what category he is moving; the healer is in a higher category, and this difference constitutes a great difficulty, but not the greatest.

It remains now to persuade the patient that the inference is true, and, by implication, that he has been guilty of falsehood; the healer becomes not πείθους δημιουργός but ζληθείας δημιουργός; it is his task to make acceptable the truth which before was unacceptable. He does not always succeed, for, being human, he is involved in errors himself, when he engages untruth, the power of which in his patient may be invincible by what arguments he commands; but if he succeeds, the despairing question

"Canst thou minister to a mind diseased,
"Pluck from the memory some rooted sorrow?"
is given its answer.

Much has been done when this stage has been reached, and much remains to do. The conflict, before which the patient originally succumbed, has been reconstituted for him, and has been reconstituted explicitly, but it has not been solved. But, with the assistance which now stands by his side, he may resume the struggle with better hope of success. At this point the process of sublimation is, I think, of capital importance. Freud describes it as follows:— "It consists in this, that sexual desire surrenders its object which aimed at partial or reproductive pleasure, and takes up another, which is genetically connected with that which has been surrendered, but must itself be called, not sexual, but social. We call this process Sublimation." It should be noted that Freud does not assert that it functions in the solution of struggle, but only that it is one aid against neuroses among others; and that he does speak of Sublimation as regulating sexual impulse; whereas it seems to me that its definition may well be extended so that it means the process by which any mental struggle is allayed, and that it is the only cure of such a struggle.

The struggle is between desire and either duty or necessity. The mere negation of one term sets an end to the

Worlesungen, p. 398.

struggle indeed, but it is not a valid solution. For it has already been shown how the denial of desire leads to neurosis, a new evil instead of an old, the origin of which being detected the mind must once more face the old problem, which, by itself, it is not more likely to solve now than before. And it is impossible to escape from either necessity or duty; for, although it is very easy to neglect duty, the fact of a neglected duty remains registered in the mind, where it must produce effects as inevitably as does the denial of desire, although in a different manner, as I shall try to show later. And also it is impossible to compromise; for although by compromise the intensity of the struggle may be reduced, yet the struggle, as such, remains, and what has been gained is this, that a conflict which perhaps was noble has become ignoble.

Here then there is a system which also is a discord; since neither of the discordant terms can be removed, nor an agreement be effected between them, it may perhaps be worth while to attempt to add a synthesis to them, which, coming later, shall justify what went before, as the Hegelian synthesis, following logically, and not chronologically, while transcending absorbs its antecedents, thesis and antithesis. This should be the true Sublimation. The method by which it is reached is not logical, and seems difficult to describe; an attempt to describe it must now be made.

Hegel reminds us that the syllogism—All men are mortal—Caius is a man—Therefore Caius is mortal—is vicious, since the validity of the major premise depends upon the truth of the conclusion. But it seems most important to add that, although the syllogism is not valid as a method of proof, yet, once the syllogism is posited, it constitutes a system which is valid in so far as it contains no contradiction and is significant because it establishes cer-

<sup>&</sup>lt;sup>8</sup>Greater Logic, ed Lasson, Vol. II, pp. 335-6.

tain relations between the terms mortality, men, and Caius. The process of thus constructing a syllogism cannot then be undertaken by reason; and it is not, in fact, constructed, but is posited in its complexity, and, when so posited, is seen to have a certain beauty even if no practical usefulness. This positing seems to me to be the purest but not the most important or interesting example of the synthetizing operation of mind.

This operation effects more important things when it creates a work of art. Such a work consists of parts, each of which is determined by the other parts. But if each part is determined only in this manner, then the whole system, being a reflection of nothing into nothing, collapses into non-existence. Each part therefore must have a content; that is (since the part is nothing but its content) it must somehow have an independent meaning. And reason cannot effect a reconciliation of this apparent contradiction, nor can it by any of its peculiar processes establish any one part of the whole work from which the others may be deduced; for each part already implies the others. But works of art are created; and, having been created, they are seen to be valid systems in which each part is now perceived to be correctly placed. The whole is related to the parts as prius; and as soon as it is given in its completeness, criticizing reason can operate upon each part; and the whole system is extremely intelligible and reasonable, but also more than this. It has already been shown that it cannot be produced by reason; and it seems better to call it the product, not of that "happy guess" as which

Olt is not asserted that they are perfectly valid. It may be presumed that perfect validity belongs only to the whole reality. But whatever validity a work of art possesses it possesses by virtue of the fact that it is an imitation of reality. The same apparent contradiction as that which affects the parts of a work of art, also affects the entities out of which Hegel probably thought reality to consist: the more intense the relation between them, the more perfect their individuality. If these entities are personal, the contradicion is less real than it is in a work of art; perhaps because a work of art is the result of finite intelligence and therefore incomplete.

Mr. Chesterton defines genius, but of the synthetizing activity of mind.

It is now suggested that an operation similar to this puts an end to struggle, and is the true Sublimation.

The struggle may be considered from the intellectual and from the ethical side. When it is considered from the intellectual side the difficulty is this, that an attempt, apparently hopeless, must be made to understand the conflict, to give it meaning and significance. (Even in physical pain part at least of the distress which is felt is due. I think, to a bewilderment; and the pain would be relieved if it were found possible to give it a place in an intelligible view of the world.) But reason cannot give such understanding, for it holds apart as two separate and irreconcilable terms the individual and his world. When the struggle is considered from the ethical side, the difficulty is, that it seems impossible to leave it behind. To abandon those dear delights of which it is demanded that they shall be abandoned; even to let go the familiar wretchedness, which seems to give a warrant to pride for railing at necessity: this seems like death to the mind. If only it were possible for me, so it is argued, to reach that state where this surrender would be known to be justified, then I might make the surrender. But I cannot surrender without justification, and justification is not achieved until the surrender is made. Thus the mind oscillates, and is helpless. There is only one escape from this dilemma, which is, to forget happiness altogether; and to understand (where the conflict is intellectual) that not happiness but understanding matters to the mind; or (where the conflict is ethical) to achieve that resignation which is not only passive submission or negation, but an active assumption of a new state, which state is nothing else than a state of profounder experience.10

<sup>&</sup>lt;sup>10</sup>The fear of the Lord is the beginning of wisdom: but the end of wisdom is the love of the Lord.

A higher category has been achieved, in which it is understood that the value of the struggle was to enrich and erect the mind; this is its justification, and its meaning; now the new wisdom would not be exchanged for the old happiness; this wisdom is a greater happiness itself. The conflict has been allayed, and not only by a process of reasoning: it has been resolved by synthesis (in its logical aspect) or by sublimation (in its practical aspect); a synthesis which contains both terms of the conflict; both evil—which has now become the object of an understanding and not of a suffering mind; and consciousness, conscious no longer of a hostile outer world, but of one which now is more truly part of itself.

In great minds the struggle will be experienced as something more than private; the evil which they feel is the evil of the world. This experience is expressed in tragedy. And tragedy already implies the need for some further advance in the progress of understanding. For the world of tragedy is not altogether evil; tragedy describes the ruin of good, and the greater the triumph of evil appears to be, the greater must be the good which perishes: it is not the mere negation of good, for a world entirely evil is merely incomprehensible and chaotic. There is defeat here; but to the feeling of exaltation which tragedy arouses defeat is only partly relevant; partly that feeling is caused by the struggle which precedes defeat. But equally tragedy does

<sup>11</sup>If this account is correct, then the connection between  $\pi \alpha \theta 0 s$  and  $\mu \alpha \theta 0 s$  signifies, not that men acquire useful knowledge by trouble, but that suffering is the necessary antecedent of wisdom. The immediacy of understanding which is reached through resignation is recorded in the book of Job, Ch. XLII, 5: "I have heard of thee by the hearing of the ear, but now mine eye seeth thee." The indirect speech of reason has become superfluous and ineffective, having been supplanted by knowledge, which, although mediated in a former state of unreflecting happiness and by suffering (thesis and antithesis) is in itself immediate. The enumeration of numerically doubled riches, with which the Book closes seems designed to mark these riches with indifference, whence it may be concluded that the wealth which Job had gained in truth lay within him and not outside.

not give perfect satisfaction: where evil finally prevails, there is not only exaltation but also despair.<sup>12</sup>

Thus tragedy is formally the antecedent of a form of art which expresses a complete understanding of evil. But also the artistic effect in itself is a first attempt to sublimate sorrow. For it is an attempt to make evil intelligible by making necessity intelligible, so that it shall be possible to submit the private sorrow to law.

Some of the greatest have reached the end of this process and, before they died, have left their record about the end in such works as the *Oedipus Coloneus*, *The Tempest*, <sup>13</sup> Samson Agonistes, and certain passages of the second part of Faust. Here satisfaction is complete. These works seem to be marred by something mystical; perhaps this is caused by insufficient understanding in the reader, who is merely presented with the appearance of reconciliation; reason (as has already been said) cannot explain synthesis; but, if once understanding has been attained, the element of mysticism vanishes.

The attempt to sublimate sorrow ends, then, with this, that a view of reality is achieved which is tragic in so far as the struggle is posited but not allayed, and harmonious in so far as the struggle is transcended and understanding reached. And it seems that this is the manner in which the operation of art should be explained in Hegelian principles. With this Freud's explanation<sup>14</sup> must be compared.

The artist elaborates his day-dreams, he says, until they

<sup>12</sup>Death is the conventional characteristic of tragedy. But it is necessary to distinguish such tragedies as contain a final reconciliation (like the Ajax) from those which do not (like Hamlet). Of these two, the former does not fall within the class of tragedy, if the above description of tragedy is accepted.

<sup>18</sup> The Tempest is the very negation of the supernatural if supernatural is taken to mean that which operates as an unknown force upon the known. The truly supernatural forces which are shown at work here are wisdom and love, sufficient to give goodliness and grace to men who without them are of the world of common clay; the miracle lies in the synthetic nature and power of these two. If it is true that Shakespeare thought that he had no more to say after he had written The Tempest, this was because he had reached complete understanding, and not because he had exhausted himself.

<sup>&</sup>lt;sup>14</sup>Vorlesungen, pp. 435-7.

lose that personal element which repels others. It is true that he elaborates; but he does so because a day-dream is, much like the dreams of sleep, full of difficulties, contradictions, impossible positions which, if they are reflected upon, must be removed. The process is one, not of simple subtraction or substitution, but of harmonizing. The personal element is removed only in so far as the self is brought into a more valid relation with the rest of reality; the particular self as such is subordinated in a system and is no longer uncontrolled; but this subordination is not a masking of the poet's self. In many tragedies no secret of the mind is left unrevealed; and, although this mind may be the mind of the hero, it is a particular mind, and it is not clear why the reader should find its secrets more acceptable than the display of the author's secrets under his own name. Next it is said that the poet disguises his daydreams, so that they do not betray their tainted source. This is a merely practical measure, not brought about by any logical necessity; but, if the day-dream, under the scrutiny of intelligence is changed into the more valid form of drama, then this change is a necessary change. And a process is described correctly and significantly when it is explained by a law and not when it is described by a contingent characteristic. Finally it is said that the poet possesses the miraculous power of forming a given material until it becomes the copy of his imaginations. This seems to be a misstatement; there is a relation of similarity between the original image and the finished work of art, but it does not seem that the relation is at all like that which subsists between original and copy. This is a question of fact. Freud concludes by saying that the artist thus enables others to obtain consolation, and, through their gratitude, achieves that the lack of which set him on the way which led him to produce his works—honours, power, and the love of women. But, if the evolution of the work of art is a dialectic process, then these advantages must be merely accidental; for they are implied in an account of the work of art which has different presuppositions; and they are not implied in the process, which is an attempt at understanding, first a private struggle, and thence the sorrow of the world. The achievement of this understanding is expressed in the work of art; and to the understanding mind those ministers of happiness have been proved irrelevancies. Thus it seems to me that Freud is right in his account of the subjective origin of works of art, and in his view that their creation gives realities, otherwise unattainable, to the creator; and he seems to be wrong in disregarding the logic which controls subjectivity, and in his view of the reality which the labour of thought renders intelligible.

It is easy to explain why Freud does not see that the relation between the work of art and the state of struggle is that between higher and lower category. The purpose of his technique is to find the cause, namely, the conflict. For often the process of analysis reaches a stage "where the doctor must tactfully withdraw;" he may indeed give help, but not professional help. And indeed the cure is effected by the synthetic operation of intellect striving with conflict. The movement which now begins is a logical movement; and it may lead to the perception and expression of beauty,15 or to beauty of conduct, as I have tried to show. Freud necessarily neglects the logical aspect both of conflict and of its sublimation; and therefore, when he perceives how the mind is eased of its burden by the creation of a work of art, his explanation is merely contingent, and also assumes a state of facts (with regard to the success of the artist) which does not agree with experience.

<sup>15&</sup>quot;Our sweetest songs are those which tell of saddest thought."

## III

But all art and rightness of living are not reached through sorrow; there are those who are so justly constituted that evil never is presented to them. Their courage is not the courage of Luther saying, "Here stand I, I cannot otherwise;" this is a courage which has known and has overcome fear; but these, although they know danger and pain, have never felt the coward moving within them, and restraining them. They have humility; not because, being mortal, they have learnt to think as it befits mortals, but because they are so harmoniously related to others that without struggle and by immediate intuition they know their human place in the order of things. This is an attitude of mind which determines much more than the relation to other men; but it is most obviously manifested in this relation, where it is found to exclude both submissiveness and pride, and to imply the power both to command and to obey rightly. Such minds in their perfection, time cannot corrupt; but, in the world of contingency, it happens that there are many who in their beginning presented the appearance of such perfection until time discovered their weakness. Therefore it was said that, Whom the gods love die young; and that youth is the part of life which lies before the time when to rejoice and to grieve is learned.16 The intellectual state of these minds is such that they are capable of faith, which implies that doubt has never arisen. seems to me that such a mind is peculiarly Christian; and that it illustrates the saying about little children, that of such is the Kingdom of God.

From what has been said it follows that this uncorrupted state is contingent; some may complete life having never known defeat through those experiences which in others would cause fear, pain or sorrow; it is not demonstrable that they must reach the end in this state, which is

<sup>&</sup>lt;sup>18</sup>Ajax. pp. 552-559.

characteristic only of youth.—And it seems to me that the nature of the growing mind of man is such as to admit and even to imply all these evils, and others; "horror and scorn and hate and fear and indignation."

This close connection between growing human intelligence and human evils was known to the writer of Genesis: and the importance which he believed it to have may be inferred from the place which he gave to the story of the Fall at the beginnings of human life. The knowledge which the tree gave was finite; it showed man the external world and himself in it, but it left him to reconcile by his own skill the discord which the cognition of externality implies. Man walks upright, and the children of men are brought forth in sorrow; he has tried to conquer nature, and he eats bread in the sweat of his face: he reasons about his actions, and he has lost innocence and knows shame. The beasts are without this good and this evil;17 finite intelligence seems to be peculiar to man; a condition where every effort, as soon as it is made, is faced with its opposite. The world of man is the world of struggle, and it is a real world, for contradiction is a characteristic of reality as it is presented to us in ordinary life. Its president is the fear of death,18 which cuts short an unresolved struggle, miserable while it lasted, and charges with meaninglessness the life which it ends. This is the antithesis of youth, the sphere of finite consciousness.

But it is impossible not to pass beyond contradiction. Knowledge of good and evil implies conscience, to which Freud gives the austere name of Censor. Through it the struggle gains significance, and by virtue of it (as was suggested above) is of greater validity than happiness, for it relates individual life to something absolute. Next, if the state where experience counts is compared with that in

<sup>&</sup>lt;sup>17</sup>Non licuit thalami expertem sine crimine vitam degere more ferae talis nec tangere curas. *Aeneid*, IV,550-1.

<sup>18</sup>Genesis, ii. 17.

which happiness counts, it appears that these two states imply different views about time. The excellence of the latter state is determined by a mere summation; that of the former, by the arrangement of its constituent terms; that is each mental state is determined by the mental states which

preceded it.

If this view is correct, a substitute has been found for the bad infinity of formal time. A temporally unending life seems to be an undemonstrated assumption; but it does not seem impossible so to conduct life as to make it infinite in the Hegelian sense. Such is the life where every struggle has been resolved; the end, whenever it comes, finishes a process which, by being ended, is perfected. And further it seems that the truthful and the untruthful life, at the end, meet justice. It may appear indeed that every truth may be denied and every wrong asserted to be right, in word or by action, to the end; and that unbearable pain may be the end of consciousness for those who struggle to live truthfully without remission; but this is an immature reflection. For death is not immediate; it can be attained only after the will has failed; and it must fail, for it looks to the future; but now, by hypothesis, there is none. At this precise moment therefore the past is presented as it was by conscience, incorruptible and unperverted by the will to deny reality. It is not the reflection upon the past, but the past itself, which determines the end, and cuts short unresolved contradictions and a merely quantitative extent of life.

The attempt was made to show above that a negation of fact vitiates all processes based upon this negation; in the category of psychology, it led to neurosis. This negation can be upheld only by an effort, and, as death approaches, this effort must relax; the moment of death must be a realization of the victory of whatever evil was embraced by the denial of truth or avoided by the neglect of duty. In this sense eternal death is the wages of sin.

But, where truth has been acknowledged, the end must be different. Whatever suffering may have appeared to mar life, when the end is reached it is past. Life has had significance because it has been accepted; and, although not eternally prolonged, it is formally infinite, because it contains no unresolved discord; and death becomes equally acceptable whether it puts a harmonious end to pain and sorrow, or cuts short an achieved serenity whose temporal extension is indifferent.

By the last moment the whole life is justified or not; but also the whole life goes towards the making of the last moment; and the last moment is the last term of a practical dialectic process, so that any objections based upon the mere duration of the final term are invalid. But it is necessary that there should be a final term: the sorrow and happiness of life must achieve a meaning, and life itself must attain the perfection of its form, in death.

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<sup>10&</sup>quot;Perhaps all the wisdom, and all truth and all sincerity, are just compressed into that inappreciable moment of time in which we step over the threshold of the invisible". Conrad, in *Heart of Darkness*. This passage, and that which precedes it, with the last words of Kurtz—"The horror! The horror!"—seems to me a convincing statement, in the form of art, of what I have attempted to state in the form of demonstration

## NICHOLAS ORESME'S LIVRE DE DIVINACION

PRECISE statement of the opinions of Nicholas Oresme on the claims of Astrology, and of those arts and sciences which in mediaeval thought were grouped therewith, is of prime importance as a prelude to fruitful enquiry into the origins and growth of "effective scepticism" in the fifteenth century and onwards.

This proposition finds much support from consideration both of the date at which Oresme wrote and of the capacities and personality of the man himself. His Livre De Divinacion<sup>2</sup> which we propose to use as text for analysis and definition of his attitude towards the occult sciences, and science in general, was written between 1361 and 1364; the whole of its author's literary production belongs to the period before the outbreak of the great Schism of the West, which, super-imposing the new problem of the healing of the Schism on to the existing one of the reform of the Church, was to divert the main stream of mental energy for forty years. The Schism, indeed, stands as a watershed separating an age in which reconstruction had appeared imperative from one in which revo-

<sup>1</sup>See Thorndike, A History of Magic and Exterimental Science, 1923, Vol. II, p. 970, and the possibilities there suggested of tracing the growth of efficient

scepticism from Oresme onwards.

<sup>&</sup>quot;Bibliothèque Nationale, MSS. français, No. 1350, fi. 39-61; "velin, dessins, lettres ornées, XVe siècle." The first portion of the volume is occupied by Oresme's work on the Sphere. The Livre De Divinacion covers 91 columns. The following MSS. of the Bib. Nat. have also been used: Fr.19951, ff. 1-31, Livre De Divinacion; Fr. N. A. 1052, ff. 1-38, Lespere; Fr. 2240, ff. 61-91, Lespere; Fr. 565, ff. 1-23, Lespere, and ff. 23-168, Le Ciel et Le Monde, (translated by Oresme from Aristotle); Fr. 1348, Quadripartyt de Ptholomee, (translation ascribed to Oresme).

lution became inevitable, in which essentially mediaeval theories of society, on which the large bulk of intellectual production continued to be based, seem to us more and more anachronistic as the fifteenth century progresses. Although it is true that mediaeval civilization may be said to have spoken its last word and made its effective contribution to the sum of human thought long before 1378, yet for the purpose of our enquiry it is important to note that the great constructive phase of the 12th and 13th centuries was followed by an age, which, while not on the whole constructive or original, did offer a contribution of a special and limited kind. Its characteristic aspect was a movement of re-editing, so to speak, and of vulgarisation. which intensified as the 14th century advanced until it reached its height, in France, under the active encouragement of Charles V.3 Oresme's work, then, takes its place as part of a great body of literature in the common tongue in which the men of his generation issue to the lay world what they think important among the works of their predecessors; which may be taken as representing, in various provinces of thought, the limits of advance possible to the mediaeval civilization with the apparatus in its possession and with the limitations of authority and method within which it felt free to act. It is the considered opinion of the mediaeval world after the opportunity of more than a century for remanipulation and reflection and as such offers a useful standard by which to gauge later progress.

Nicholas Oresme was born c. 1320, probably in Normandy, entered the College of Navarre in 1348, and was Grand Master and Professor of Theology therein from 1356 to 1361 when he accepted the Deanship of Rouen. He showed some human weakness in refusing to relinquish his university office until compelled to abandon his claim

For details of the activity of the French translators of the 14th century see Delisle, Recherches sur La Librairie de Charles V, Paris, 1907.

by a decision of the Parliament of Paris. In 1378, perhaps as reward for his translation of Aristotle's works into French, in which Charles V took so ardent an interest, he was given the Bishopric of Lisieux and died holding that office in 1382. His literary activity falls into two easily defined sections. That covered by his stay at the College of Navarre may conveniently be called his Latin period; in it his productions included works on judicial astronomy, on physical science, on the sphere, and, of course, on theology, along with the work by which he is perhaps best known in modern times, his treatise on money. At Rouen followed his French period in which he turned into the tongue of the layman the substance of some of his earlier writings on astrology and the treatise on money, and carried to an end the great task of the translation of the Ethics, Economics, and Politics of Aristotle into French. To these years belongs also the remarkable advent sermon preached before Urban V at Avignon in December of 1363. It may be added that Oresme has shared the common lot of the writers of his age in having attributed to him the authorship of the Somnium Viridarii

On the side of sagacity, intellectual power, and equipment with the apparatus of scholarship as it existed in his day, his fitness to be accepted as witness for the expiring middle ages is undoubted. In his economic treatise he anticipated the theories of Copernicus and Gresham and showed a clear conception of the history of money and of its function in the commonwealth, along with extraordinary boldness in criticism of contemporary abuses, in the shape of debasement of the coinage. His works on physical science justify the description of him by Picus da Mirandola as philosophus acutissimus et peritissimus mathematicus. In his French version of Aristotle, however imperfect from the standpoint of modern scholarship, we find clear expression of difficult ideas in an imperfect medium and

again much shrewd comment on the institutions of his time and on government in general. Finally he possessed, to an extent unusual among scholars, the power of lucid exposition for the unlearned; we may cite, in particular evidence of this, his little work on the Sphere, in which he summarizes what his generation knew of the physical universe. In fine, then, we have to do with a mind that would have been eminent in any age in enquiry demanding native power, balance, and capacity for accurate analysis. With this we have to record the important fact that he is, in religious belief, orthodox, and in that essential representative. His limitations will appear from examination of the content of his book against divination.

Before proceeding to allow Oresme to testify for himself and his age it may be noted that Meunier (1857) and Jourdain (1888) have dealt with him and his work and, in the case of the latter, more particularly with his views on astrology. It is a defect, however, in Jourdain's study that a general attitude of condemnation towards the occult sciences is assumed on the part of our author, without close analysis of what exactly he accepted and rejected, and, above all, of his grounds for so doing; nor is any attempt made to present a sum-total of Oresme's beliefs and methods.<sup>3a</sup>

On the general question of the prevalence of superstition in the 14th and 15th centuries little need be said. Without giving too much weight to the evidence furnished by the somewhat misleading titles of the books in the great library of Charles V the most significant indications may be briefly exemplified. Thus, such men as Oresme and Gerson thought it urgent to write in condemnation of the

<sup>3°</sup>See Fr. Meunier, Essai sur la Vie et les Oeuvres de Nicole Oresme, Paris, 1857; Ch. Jourdain, Nicolas Oresme et les astrologues de la Cour de Charles V, Revue des Questions Historiques, 1875; P. Feret, La Faculté de Théologie de Paris, III, 1896; E. Bridrey, La Théorie de la Monnaie au XIVe Siècle: Nicole Oresme, Paris, 1906.

superstition that existed in the highest places; Gerson addresses to the medical graduates of Paris a solemn warning against the use of spells and the belief in the special virtues of certain days for the purpose of medical treatment. Pierre d'Ailly is strong against astrology but we find plainly set forth in his works his own waverings on the question of the influence of the planets on the formation of the great religious sects; and as the limit of credulity and misapplied energy on the part of the learned we have the stupidities of Oresme's contemporary John of Legnano, Professor of Law at Bologna, friend and adviser of Popes, as included in his *De Bello*, and in his *Sommium*. We may safely argue to gross superstition on the part of the upper classes of the laity; the populace was, as always, of quite instinctive and primitive belief in these matters.

We proceed to review the contents of the *Livre De Divinacion*, not attempting to present in detail Oresme's treatment, but to select such aspects of it as we believe significant, as contributing to a clear conception of the place he occupies in the history of science and scientific method.

The Livre De Divinacion, so named, as Oresme tells us, after Cicero's De divinatione, contains seventeen chapters which may be thus classified. The first four, descriptive and general, sketch the intention and plan of the work; three chapters, setting out the arguments pro, that is, in favor of belief in the efficacy of the divinatory arts, are followed by three devoted to arguments contra drawn from experience, authority, and reason. The next three chapters, 11, 12, 13, deal somewhat miscellaneously with the lack of certainty in the attempts of these arts to forecast the future, the deception which they in-

<sup>&</sup>lt;sup>4</sup>In 1389. Cf. his Tractatus de erroribus circa artem magicam et articulis reprobatis, in Opera, Vol. I, col. 210.

<sup>&</sup>lt;sup>5</sup>In his Tractatus contra Astronomos, e. g., cap. VII.

volve, and the fitting attitude of princes towards them. In three chapters the arguments *pro* are countered, and the last chapter contains the recapitulation and conclusion. The method employed is plainly that commonly known as the scholastic, applied here with a certain looseness, perhaps justified in the writer's eyes by the nature of the audience to which the book was addressed, that is, the lay world. It is my intention, says Oresme, to show from experience, authority and reason, that it is foolish, wicked, and dangerous temporally, to set oneself to know future events and hidden things by means of astrology, gromancy, or any other such arts, and further that it is most perilous of all to those of high estate to whom appertains the rule of the body politic.

His analysis of Astrology which follows establishes for us his main position, shows, in broad outline at least, what he accepts, and what he rejects, with some indication of his grounds therefor. Astrology has six chief parts:— The first enquires into the movements, signs and measurements of the heavenly bodies, so that tables may be constructed which may foretell future movements of constellations, eclipses, and similar phenomena. Astrology, thus defined, is a speculative and mathematical science, but it cannot be considered an exact one. The second deals with the influences and natural powers of the same bodies. Thus a star in one quarter of the heavens signifies or has power to cause heat or cold, drought or rain. This division of astrology is also a great science and knowledge therein is possible, but we know too little about it; what is set down in the books is lacking in proof; what was true for particular times and places need not hold good here and now. The third part of astrology covers the revolutions of the stars and the conjunctions of the planets. This knowledge is applied to three kinds of judgments (predictions) in which

<sup>\*</sup>Livre De Divinacion, Cap. 1, 2.

we attempt (a) To predict from observation of the conjunctions of the planets the great terrestrial events, pestilences, mortalities, famines, floods, great wars, the fall of empires and the like. These matters can be sufficiently well known but only in general terms; we cannot know in what country or to what persons, or under what conditions these things will happen. (b) To know the weather and its changes, winds, storms, etc. Here knowledge is possible, but not accuracy, and farmers and sailors are often better prophets than astronomers. (c) To know the humours of the body, when to take medicines, and so on. In this respect something may be known so far as the effect of the sun and moon is concerned, but beyond that, nothing.

To this point he has been dealing with natural influences and effects; he passes next to the fourth division of astrology which is concerned with nativities and attempts to predict man's future from the position of constellations at the time of his birth. It is possible thus to ascertain a man's complexion and inclination but not his fortune, or those events which may be hindered or prevented by the exercise of the human will. At this stage we may consider that Oresme draws a line separating those parts of astrology in which he has a more or less qualified belief from those to which his attitude is one of complete incredulity. The fifth division of astrology attempts to answer various questions from consideration of the arrangement of the heavens at the moment the question is asked. The sixth is concerned with elections or choices, as in the case of the appropriate time for beginning a journey, changing a garment, etc. These two parts of the science have no basis in reason. A long string of practices and claims is next dismissed in the same emphatic terms as are the fifth and sixth divisions of the science, with an exception made

<sup>&</sup>lt;sup>7</sup>Op. cit., cap. 3, and cap. 11.

for palmistry.<sup>8</sup> This science he considers to be a part of philosophy and it may have some basis of truth in so far as it indicates the complexion or inclination but not when it attempts to particularize; many of the rules to be found in the manuals are false.

Without comment on the position here revealed we may next glean from Oresme's detailed treatment of his subject as thus classified, such clues to his beliefs, reasons, and methods as are pertinent to our general purpose. We take his own order of authority, experience, and human reason, though it must be confessed that in the LIVRE itself a rigid separation between these is scarcely adhered to. Although he expressly disclaims the necessity for complete knowledge of the history of the practices he condemns yet he follows tradition in presenting an imposing series of references to authorities both pagan and Christian, mentioning indeed, beside the Scriptures and the Decretals, no fewer than forty-eight writers or works.9 In general it may be said, so far as we have verified these, that they are without the secondhandedness often concealed in mediaeval writers by such parade of learning, though there is little to distinguish the use made of them from the customary practice of the mediaeval world. We may select certain points as typical. The first is the stress laid on the real reason for the award to the Israelites of the promised land. It was not on account of their own "justice" but plainly and clearly because of the iniquities of the inhabitants as shown in their abominable practices; "and certainly the man who considers this text, so ancient, so approved, received by all Christians, Saracens, and Jews, must have great horror of meddling with divination.10 Further it is significant that Oresme should seriously cite St. Isidore

 $<sup>^8\</sup>mathrm{Cap.}$  3.  $^9\mathrm{These}$  do not all occur under the heading "authority" but at every turn.

as an authority.11 On the other hand we may credit him with some measure of discrimination. Replying to arguments drawn from the recorded knowledge of princes of old time in these matters, we read, "There have been many who knew much less of these things than has been attributed to them, there has been exaggeration so as to give honour to the prince and the science, and they did not write the works that have been credited to them. Almagest was not written by Ptolemy, King of Egypt, but by another of the same name, just as the books attributed to Solomon and Hermes were so named to increase their authority; in the case of Alphonse of Spain his name was given to a work composed by men acting under his orders; the book of secrets was not written by Aristotle. ne il navoit telle maniere de parler comme il a en ce livre qui nest pas de grant auctorite et que Aristote ne fist pas."12 The general conclusion to be drawn from the Scriptures, saints, and doctors, is that such methods of penetration into the unknown are sinful; from the pagan writers, that they accord ill with the prosperity of the state and its citizens.

Passing to the deductions to be drawn from "experience" Oresme in his review of the fates of men and empires shows wide reading and much understanding without departing from a well beaten track. The apparently approved and profitable use of the occult arts by leading personages of the Old Testament and of profane history is examined, and it is demonstrated that the use of these arts did not bring prosperity, or, alternatively, that they were not practiced as alleged, or, alternatively again, that they may have been used by special divine permission. Against such instances can be set the dismal fate of a long line of worthies from Zoroaster and Nectanebus down to Ferrand, Count of Flanders, James, King of Majorca, and others

<sup>&</sup>lt;sup>11</sup>C. 9, C. 15.

<sup>&</sup>lt;sup>12</sup>C. 14.

near to the writer's own day.13 Generally it appears as if fortune had fought against all these men but in reality they were punished by God for attempting to invade regions of nature, or of the future, which are closed to man's knowledge.14 This style of argument is familiar enough to readers of mediaeval speculation in these fields of thought but there are important incidental admissions which help us to formulate Oresme's creed. He clearly accepts the existence of magic and magical practices. 15 The occult arts have driven men out of their senses and madmen are peculiarly susceptible to them.<sup>18</sup> People thus distraught by illness or by magic art may see the absent or the future although their visions are often false, or obscure. and certainly dangerous of acceptance. Diviners, when they doubt the fulfilment of their prophecy, bring it to pass by other means, by treason, fraud, necromancy, or otherwise. Again some may have visions in dreams, or because they are "arreptices" or "epileutiques" or demoniacs, or because they aid themselves by magic; and often things turn out as they have foretold and they pretend to have known them by revelation from God, or by astronomy, or by other lawful means, as Mahomet did.17 Oresme accepts, too, the possibilities of alchemy. When the alchemist succeeds once or twice in making gold he is afterwards so drawn to his art that he cannot forsake its exercise and ruins himself thereby. And as the alchemist comes to grief when trying to penetrate the secrets of nature so does the astrologer when attempting to lift the veil which hides fortune from us; both are moved to these things by the craft of the devil. The only legitimate way to discovery is by divine revelation, or by the use of reason, or by such visions and powers

<sup>&</sup>lt;sup>15</sup>e. g. C. 12, C. 15. <sup>16</sup>C. 11. <sup>17</sup>C. 12.

of prophecy as come to those of sober and peaceful life, whose soul is "aussi comme un vray miroir cler et resplendissant, asprete de cogitacions mondaines". 18 Animals such as the swan, the owl, the halcyon, the dolphin, and the war-horse, have foreknowledge of the future19 but man, provided at birth with no knowledge except of how to weep, has been endowed with reason which enables him to provide for good or evil hap.20 As regards weather prophecy, it is better to study profoundly astronomy, or, better still, the mutations of the air, than to rely on diviners. The power of suggestion is accepted and stressed; enquiries into the future may not only be a sign of bad fortune but the cause of it. A favourable reply causes a man to go too rashly, impetuously, and madly into an enterprise; if the response is unfavourable then a hesitating advance may in itself be the cause of failure; the recipient attempts his task "comme chancellant et clochant de mauvais esmouvement";21 many have come to evil fate because they feared the fates.

We present next the gist of those arguments used by Oresme which appear to him to fall under the description of "human reason". We may quote first his general statement that to prove his thesis as to the falsity of the claims of the astrologers and diviners it is quite unnecessary to know perfectly all their sciences, any more than one needs to hesitate to condemn, without complete knowledge of them, such games as "tables" and dice; reasoning from general principles suffices.22 Then, according to Aristotle, fortune is a natural inclination to good or bad luck which is independent of either good or bad advice, and the tendency of the individual in this respect can be ascertained only from the manifested results, and cannot be known

<sup>&</sup>lt;sup>18</sup>C. 11. <sup>19</sup>C. 16. <sup>20</sup>C. 15. <sup>21</sup>C. 10.

before those results have been observed. Even if it were possible to know fortune beforehand yet such knowledge could be only of general tendencies and could be of no service with regard to particular effects, so that it is a great waste to devote energy to the matter. Similarly if we consider the four passions which make up "courage", that is, joy, sadness, hope, and fear, and remember that other things being equal, where there is more passion there is less reason; and where reason is lacking more is left to chance; then we may conclude as to the peril of practices which tend to increase the aforesaid passions and leave less to the control of reason.23 The familiar dilemma as to free will and necessity is emphasized; if what is predicted cannot be hindered why trouble to know it: and if it can be hindered then it cannot be said to be known beforehand. All the books of predictions show that their authors believe in necessity though they often allege the contrary. Again many of the rules of judicial astrology are based on fable, poetry, and rhetoric, which cannot be accepted in natural science; this applies especially to the whole business of the shapes and names of the constellations. Poets have pretended that good princes were changed into stars, just as old women to-day speak of the "bourdon St. Martin" and call the Milky Way the"chemin St. Jacques". The old names were given to the constellations simply as a matter of convenience for purposes of reference and identification, and names of persons were used only because many of the constellations had no shape which justified the bestowal of such names as the Plough, the Crown, etc. Yet many of the rules of judicial astrology are based on these names or on the qualities to be inferred from them; as for instance the idea that a man born under the Ram will be liberal because the sheep parts willingly with its fleece; if he is born

<sup>&</sup>lt;sup>22</sup>C. 4. <sup>28</sup>C. 10.

under the Bull he will be a tiller of the ground, and "semblable truffes". It is useless to say more of this because the man who is open to believe it is without reason; if he understands reason he need only consider the matter for himself. In somewhat marked contrast to these views we meet apparent approval of the opinion ascribed to Ptolemy that those who live towards the south are more apt for the acquisition of astrological knowledge than those inhabiting the regions towards the north, and, similarly, Haly says that the people of the east are equally favoured in comparison with those of the west. And it seems to Oresme to be "selon raison" that those should have little benefit from judicial astrology who are not inclined thereto by nature, so that it would appear that Frenchmen, and still more Englishmen, and those living beyond them towards the northern and western confines of the world. can have little advantage from these studies.24 Further it is a great mockery and abuse of reason to believe that an astrologer should by his art make accurate forecast of matters which are under the control of the changeable human will, while, at the same time, they are unable to tell us what tomorrow's weather will be, or prophecy a change of the wind. Yet these latter phenomena follow exactly the influences of the heavens and cannot be altered except by divine miracle. In general we may presume that men should act on Seneca's saying, "I know not what the future may bring; I do know that it is wise to despair of nothing, to use good counsel, and to be prepared for all."25 The men whom princes should honour are those true students who make careful observations, who examine with a calm mind the nature of things.

<sup>&</sup>lt;sup>24</sup>C. 11. In this connection cf. the view that the earliest astronomical observations were taken between 30 and 40 degrees N. and perhaps between the sources of the Oxus and the Indus; see Proctor, origin of the Constellation Figures, in Myths and Marvels of Astronomy, London, 1878.

<sup>25</sup>C. 10.

From the summary of Oresme's opinions here offered we have, we believe, omitted no significant aspect, whether of treatment, or of result; we have to ask if it shows advance, if it marks a stage on the road to a scientific attitude to astrology, if it undermines the whole position of the occult sciences by the provision of real bases for criticism. There is scarcely need of a detailed demonstration of the fact that we are faced here with the statement of the orthodox mediaeval position;26 that there is no pertinent argument, no way of approach used by Oresme, that cannot be paralleled from the works of his predecessors. He follows a way marked out by a long succession of thinkers and their limitations and difficulties are his. Like them he appears to us, who are wise after the event, or many events, to be unaccountably blind to the way of exit from the cage, of whose existence they are more or less conscious, which shut off so many mediaeval searchers from the secrets of nature. We have the same acceptance of astrology, with the same limitations, the same saving clauses, the same condemnations, and the same admissions as to illicit possibilities of obtaining knowledge. Such differences as distinguish Oresme from earlier advocates of restraint in respect to the claims of judicial astronomy are those of emphasis, of particular concrete argument, in short, those native and peculiar to him as an individual.

For the sake of economy in research in a somewhat extensive field we may go further and say that during the lifetime of Gerson and d'Ailly, the position remains the same, that these two men are on the whole less, and not more, sceptical than Oresme appears to be. Both are sincerely anxious that lay society should be restrained from foolish belief, both will be accepted as intelligent and learned, both fail to furnish adequate institutes on which

rejection of superstition should be grounded. Gerson<sup>27</sup> admits the claims of the noble science of astrology as Oresme does; he ridicules the tricks of the soothsayers' trade and believes that they get good results by secret enquiries or by commerce with demons. He condemns the folly of the rulers of the commonwealth, who can neglect the opinion of hundreds, nay of a whole kingdom, to listen to that of two or three sham scientists; who can, on the advice of the latter, postpone a campaign for three months or a year while the enemy are destroying all before them. He is strong on the side of the angels and the saints, as against the stars and astronomers; but we must note his decision, if it can be called a decision, in a case that seems crucial as guide to his position. Suppose that in the matter of the war with England the astrologers, men of honest life, whose knowledge is based on true philosophy and natural reason, are in accord in announcing that such and such a constellation is menacing (prohibens non tamen ex necessitate); whilst wise captains and soldiers think that the campaign is expedient. In such a case the two opinions are to be weighed and on the balance of evidence the decision is to be taken. D'Ailly shows similar hesitation and gives the strong impression of real perplexity in face of the maze of opinion available to him. He cannot believe that the planets are signs and signs only; they must have influence (aliquid faciant in exercitando). As a fairly conclusive illustration of his standpoint we may recall his deduction after examining the doctrine of the

<sup>&</sup>lt;sup>27</sup>For Gerson's views see OPERA, Ed. Ellis du Pin, Antwerp, 1706, vol. I., and especially:—Epistola ad Studentes Collegii Navarrae ut posthabitis recentioribus antiquiores legant; Trilogium Astrologiae Thrologizatae: Tractatus contra superstitiosam dierum observationem; Opusculum adversus doctrinam cuiusdam Medici Montis-Pessulam etc.; Tractatus de observatione dierum quantum ad opera: Tractatus de erroribus circa Artem magicam, et articulis reprobatis; Tractatus an liceat Christiano initia rerum observare ex coe lestium syderum respectu.

For those of Pierre d'Ailly his *Tractatus contra Astronomos*, printed in Appendix to above quoted vol. of Gerson's works has been used. His other scientific works have not been examined.

astrologers to the effect that the six sects of Hebrews, Chaldeans, Egyptians, Saracens, Christians, and of Anti-Christ, have arisen, or will arise, under the influence of various appropriate planets. He is inclined to accept this possibility for sects other than Christian quantum ad illa quae in illis naturaliter sunt et naturaliter fiunt. In the case of the birth of Christ it is not dissonant with the Faith, or with natural reason, to suppose that our Lawgiver was born of a good complexion because he was born under a good disposition of the heavens. It is not entirely useless to draw up the figure of the Nativity so that we may note what was according to the astronomers the position of the constellations at the time.

The demonstration that the position held by Oresme, and by two leaders of thought in the generation following him, is what may be termed orthodox, and authorized, is of some value in establishing a point of departure for future research; it must, however, be considered incomplete unless we can obtain from it some clue to a possible line of advance, or, alternatively, some characteristic common to these writers, some difficulty felt by them, which may lead to the discovery of such clue. We are confronted by two clear facts, that a traditional attitude was the one held by Oresme and his fellows at the end of the 14th century and that in the mid-sixteenth century for example, there is change; at the latter date, if scepticism is not efficient, it is potentially so and bases for that scepticism have been furnished. We have to ask for some sign, in the Livre De Divinacion and kindred treatises, of the cause or origins of the change. Generalisations as to Reformation and Renaissance will, nowadays, hardly be accepted as meeting the case, though they have often been allowed to serve as sufficient explanation. The Reformation, with its close reliance on the text of Scripture, will scarcely be regarded as removing the effects of accept-

ance of tradition and of a series of misleading prohibitions to be found in the Old Testament; a curious commentary on this suggestion is to be found in Calvin's Avertissement contre l'Astrologie qu'on appelle judiciaire.28 The Renaissance, again, in so far as it was a return to antiquity, could not serve as adequate safeguard against superstition or as an incentive to the use of a rigidly scientific method; it may, indeed, have involved a breach of continuity in a slow process of advance. We may accept the traditional view of the awakening of a general spirit of enquiry and criticism, of the general "quickening and enlightening" of the human mind, to be placed in broad contrast with a certain strange inertia of the mediaeval spirit not conducive to those outbursts of discovery in science that have distinguished some epochs of history. But, within these generalisations, we feel it advisable to penetrate closer to the particular manifestation and application of the working of the spirit of enquiry which acted in this field of research, which furnished eventually true bases for criticism and rejection of the claims of the astrologers.

We approach the essentials of the problem is we endeavour to visualise and define the circle of knowledge within which Oresme and his fellows stood, if we trace the frontier of the explored territory of which they were in possession. Now, in casting up the account and presenting a sort of balance sheet of belief and knowledge in the case of Oresme we are at once met by a fundamental and significant difficulty, one that seems to be inherent, namely, that it is impossible to draw a line sharply dividing knowledge from ignorance, or, that if such a line be drawn, we are left with a statement of the case so incomplete as to

<sup>&</sup>lt;sup>28</sup>Avertissement contre l'Astrologie qu'en appelle judiciaire et autres curios itez qui regannt aujourdhui au monde, par. M. Jean Calvin, Geneva, 1549, printed in Corpus Reformatorum, Vol. XXXV, Brunswick, 1868. Calvin's work is characterized rather by a lively treatment and by an admixture of his own peculiar doctrines than by the use of bases for criticism which are other than mediaeval.

be misleading for the purpose of future research. mediaeval worker in this province has pressing on him what was undoubtedly the heavy weight of the accumulated lore of the past, a great assemblage of opinion of which the record of observed and verified fact formed but a minor part. He has the scripture revelation in which many things were forbidden in prohibitions, which went far to establish the existence of a world of magic, for why should the divinatory arts be so solemnly and repeatedly condemned if there were no possibility of dangerous contacts and knowledge. As part of his inheritance there is also that strong tendency to believe that knowledge, or the royal road to it, may be found somewhere in a book,29 and not in the strict and precise observation of the material universe. In the modern case we have on the one hand, knowledge, and knowledge to be used as stock and apparatus, as intellectual capital for further accumulation and advance; and on the other, the limitless territory which science proposes to explore, and in which outposts have been established. Progress is not, in the abstract, hindered by tradition, prohibitions, counsels of expediency. This is, of course, to idealise and overstate the modern position but the broad contrast as between the best intellects of the ages under comparison may be accepted.

We have thus in mediaeval writings on astrology and divination a strange series of cross divisions; knowledge and ignorance, lawful and unlawful, sinful and approved, expedient and inexpedient, are some of these. From this atmosphere of hesitation and uncertainty we may extricate, nevertheless, one statement, not as to knowledge, but as to method, which is made clearly and unambiguously, and examination of its import will help to explain why Oresme and mediaeval investigators in general were thrown back on to the serious consideration of much in the

<sup>29</sup> As apparently even Picus da Mirandola thought.

way of argument that science now dismisses as irrelevant. Through the treatises of Oresme, Gerson, and d'Ailly there runs, like a refrain, the constantly repeated formula as to the methods by which knowledge may legitimately be ac quired, that is, by Divine revelation, or by the exercise of human reason. Now the traditional description of the mediaeval period as the Age of Faith indicates a somewhat distorted estimate of the relative values ascribed to these two methods by mediaeval thinkers; we are apt to argue as if they attributed to faith something approaching a monopoly, as if they had no faith in reason. But reason had been bestowed by God as the approved and appointed instrument for progress in knowledge of his works. It is true that presumed possession of the scheme of the universe as revealed in the scriptures resulted in a certain mental passivity in some directions, and with this the age may well be reproached; as an interesting parallel to it we have the mediaeval synthesis of world history, which, established by Christian authors before the fall of the Roman Empire appears as a leading cause or excuse for the almost com plete neglect of history in the modern and more scientific sense. At the same time it is to be remembered that think ers of the middle age were quite as capable as those of later days of making the literal meaning of the scriptures fit in with the evidence of their senses, with the obvious facts of everyday life. It was just because the facts of the physical universe were not obvious that the way was left open for exaggerated caution as to the possibilities of progress in science, or for the pseudo-science of the astrologers and soothsayers, as such. The root difficulty facing our authors is to be found when we come to consider the meagreness of the material on which human reason might be exercised in their day. Leaving on one side the causes for the scarcity, for the lack of progressive accumulation of data, we have to conclude that it was this scarcity which led to such reliance on authority, to such odd discussion of scientific bases as if they were matters of opinion. And by contrast we may note that, where the material was more easily accessible, real advance could be made, as in the case of Oresme's own contribution to economic theory, where the debasement of the coinage, and the consequences of it, were phenomena available for examination in the laboratory of life around him. The motions of the heavenly bodies and their relations are not in any age as obvious as the price of bread.

We appear to limit still further the area within which the answer to our enquiry is to be found when we come to examine a particular concrete example of the difficulties which stood in the way of advance on Oresme's part. It will have been noted that he emphasises strongly the uncertainty, the incompleteness, of even those parts of the study of the heavens which are in general considered legitimate and approved. The noble and excellent science of Astronomy cannot be known precisément et a point; the general may be known but not the particular. Gerson is clear that true science is not dissonant with theology, omne verum omni vero consonat and so on; he lays as much stress on the value of sober and accurate observation as any modern could desire; but with this there goes his evident perplexity at the lack of trustworthy record of observation, at the obvious conflict between those observations and the facts evident to his senses. The desire he shares with Pierre d'Ailly that those claiming knowledge of astronomy should be tested as to their science, and that the literature of the subject should be sifted, breaks down and becomes ineffective at this point; it was the standard of test that was lacking and among "so many and various observations" he was in practice unable to decide and confesses that, of the phenomena of the celestial movements and relations, much more was unknown than known. Pierre d'Ailly finds

diversity among recorded observations a reason for the same kind of perplexity, and from earnest striving to arrive at sound bases for knowledge there emerges his conclusion, quod proposita quaestio de commensurabilitate motuum coelestium est problema neutrum de quo naturaliter haberi non potest evidens certitudo. For even in terrestrial matters and those close at hand nequeat saepe punctualis praecisio deprehendi, sed minor pars quam millesima aequalitatem tollat et proportionem de rationali ad irrationalem commutet.

This distrust of their data, of the premises on which human reason had to work, is used by the authors with whom we are concerned as a weapon with which to attack astrologers and diviners; if astronomy lacked certainty then still less could the particular deductions of the soothsavers be accepted by reasonable men. We may find in it, however, an antecedent to the process which was to lead to the rejection of the Ptolemaic scheme, and with extraordinary slowness,30 to the disappearance of the sciences which Oresme is anxious to condemn. The dissatisfaction illustrated tends to concentrate on the obvious failure of astronomical science when essaying to fix the length of the solar year, and, not only its length, but as Gerson says in a phrase, illuminating in this connection, ex qua radice procedit. "And if we fall short of accuracy when we attempt to determine the measures of the sun's motion how great is the error of those who presume to draw up halmanacks or exact and perpetual calendars." It was in this form that an ultimate and vital problem presented itself as one of practical importance and reached the understanding of the less scientific portion of European society so that Popes and Councils were concerned; and it is here, too, that we have a link with the work which may be considered

<sup>&</sup>lt;sup>20</sup>The opinions of Lord Bacon on these matters will perhaps suffice as illustration.

as the outcome of the dissatisfaction and groping exemplified by Oresme's little book. Copernicus in his preface<sup>31</sup> touches this matter among the reasons he sets forth for his research. The mathematicians are not in accord, they are not certain as to the motions of the sun and moon ut nec vertentis anni perpetuam magnitudinem demonstrare aut observare possint.

There is much to be said for the opinion that Copernicus' work was the culmination of mediaeval effort. He uses authority, it is true, but sparingly, and chiefly as a fairly obvious excuse for casting back to the heliocentric doctrine: his treatment of Lactantius was likely to arouse some consternation in the mediaeval mind; but the spirit of his reference to those who would condemn him on the ground of some passage of scripture male ad suum propositum detortum is mediaeval enough. His fundamental reason for rejection of the Ptolematic system, that of its inadequacy to present a regular and unfailing synthesis of a universe founded propter nos ab optimo et regularissimo omnium opifice is one well in keeping with the efforts of the mediaeval compilers of Summae and Specula in other fields of thought. The genius which took the form of infinite labour in accumulation of exact observations and of boldness in deduction therefrom is to be paralleled, however, only in departments of thought other than that of natural science in the earlier mediaeval world, and this is a main reason for hesitation in describing his Great Charter of scientific method as mediaeval. The verdict will be governed to a large degree by the results of further research

having as its intention the filling in of the gap between Oresme and Copernicus. Such research will be obliged to include careful examination of the works of the writers of the intervening period and above all must consider how far there was, in this century or so of interval, improvement

<sup>31</sup> The edition of 1543 has been used.

in the instruments and methods of measurement, of calculation, and record. It may thus be possible to establish some curve of progress leading from the position of discontent we have attempted to analyse to the great demonstration of 1543. It may be, however, that such ancestry for Copernicus cannot be established and that the "how" and "why" of the appearance of that solution at that time elude historical analysis.<sup>32</sup>

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a2Since this analysis of Oresme's treatise was written I have discovered (a) that the *Demonstracions contre Sortileges* of Eustache Deschamps, (ed. Soc. des Anciens Textes Français, vol. VII, pp. 192-199.) is for the most part a transcript of certain sections of the *Livre* and may be used for correction and confirmation of the text thereof; also that the Bodleian MS. Can. Misc. CCXLVIII is a Latin translation of the French text. For this and for notice of borrowings from the *Livre* in the *Somnium Viridarii* see my note in *Romania*, July, 1926, pp. 355-361, "Eustache Deschamps and Nicholas Oresme. A note on the *Demonstracions contre Sortileges.*"

### THE METAPHYSICS OF THE INSTRUMENT

PART TWO: THINKING AS INSTRUMENTAL

1

REFERENCE to mind is highly ambiguous. But before we proceed to exacter definition let us recall that in speaking of the fashioning of instruments mention was made of the presence of designs, ideas, patterns, mental blueprints, etc., which were indispensable to the resolution of certain construction problems. We shall regard these plans and trains of inference, distinct from purposes, as the denotative equivalent of mind and inquire whether an interpretation of mind as instrumental will clarify the operation of thinking and disclose certain characters of the objective milieu in which that thinking goes on. Proceeding as naively as above we shall make a "pseudo-phenomenological" survey and enumerate those features of thinking and mechanical instrumentation which appear identical or closely similar.

- (1) The instrument, as we saw, is called into play in order to eliminate certain difficulties and transform possible linkages among things into actual linkages. Thinking takes place in problematic indeterminate situations in order to settle doubt and fix belief by effecting a relative stability in subject-matter.
- (2) The instrument cannot make over existence by being placed in mere physical juxtaposition with it. The instrument is mediate in nature and operation. Thinking

or inference is essentially mediate, acting upon what is immediately given, not known, through the causal intermediation of the sense organs. Just as the instrument in action must have something to take hold of, so the mind must have a leverage in structures and meanings already discovered.

- (3) The construction and application of the instrument implies an anterior knowledge of laws and processes other than those which it is its avowed intent to discover. The presence of effective thought presupposes a whole body of prior knowledge which is brought to bear to purify the muddied presentations of sense and convert them into knowledge terms. Only because some affairs are already settled can we undertake to settle other affairs.
- (4) There is a certain continuity and *coherence* among the parts of a machine. The parts must dovetail to insure the transmission of force or energy from "driver" through "a train of mechanism" to "follower" where the resistance is overcome. Lack of *coherence* in *thinking* may be a sign of complexity of subject-matter but is a sure warning that thinking cannot be successfully terminated save by accident; and since the practical purposes of thinking demand extension and generalization, the results of a chance occurrence may, if generalized, disorganize other subject-matters.
- (5) There is a "living moment" or "organic unity" in the instrument which supplies both impetus and direction to its growth and improvement. Its entire mechanism does not interact at a given moment with a focal point or single aspect of the material it works upon. Although not held together by an "organismic" tie, it is something more than the sum of its parts and elements. Its various parts may suggest revision, amplification or rejection of their mechanical arrangements or positions without thereby necessitating the scrapping of the whole machine or its distinctive rationale. The "living movement" of thought follows

from its mediate character. The reciprocal influence between thought and the signs and data with which thought operates,—extends, modifies and systematizes meanings, so that the specific situation as a whole is illumined by a concrete universal. The concrete universal may be no more possible of ultimate realization than a perfect machine, but as inference becomes more detailed and adequate, checked by the cooperative inquiry of experiment and application, it approaches it asymtotically.

- (6) Both instruments and thoughts represent the social character of experience. They express and communicate the purposes for which they are instrumentalities. In the first case, the reference to action and physical manipulation is open and unquestioned; in the other, indirect and removed. But where the outcome of thought has momentous consequences for the organism, we recognize its purport by what is in the last analysis *done* rather than by what is *said*, just as a child discerns the immediate purpose of the doctor not in his reassuring remarks but in the instruments he extracts from his tool kit. Later on that immediate purpose acquires a new meaning in the light of a bodily cure.
- (7) Instruments may be removed from their contexts and converted to serve aesthetic ends, or more precisely, set up as aesthetic goods. The poisoned daggers and rings of the Renaissance have become *objects d'art*. Similarly, thinking may be detached from connection with vital and urgent problems in natural and human affairs and become an immediate good of enjoyment, as when we read G. E. Moore for logical exercise or play chess. But it does not even then become a stranger to the world of practice. It is still a mode of activity surcharged with directly enjoyed meanings which enhance one another and whose elaboration makes accessible subtler vistas in other fields and realms, enlivening the faded and enriching the familiar.

The enumeration of these characteristics of thinking is not intended to be exhaustive or irreducible. Whatever else may be added, those already mentioned, however, entail several conclusions concerning the nature of thinking or mind. (a) Thought cannot be epiphenomenal or automatic, idly mirroring an idle play of physical figures. (b) It must be of the same generic order as the object to which it is applied, for, if it is regarded as transcendent or transcendental, all discussion founders on the question of how thought can be practical. (c) It implies an incomplete system of relationships among things in which those terms most important for control receive most emphasis. (d) Hence, it must forego its claims to finality and accept without demur its status as an instrument continuously striving for greater efficacy in the definite case. When it settles itself or comes to rest, it is not yet at ease in Zion. It may go on from its resting place like the physical instrument or it may not—the determining factor is the nature of the subject-matter. Where the environment is precarious and shifting, thinking becomes chameleon-like, its rapid changes flashing back the colors and difficulties of its problems; where the environment is relatively stable, the tempo slows down and instrumentalities become permanent fixtures, everlasting rather than eternal, often objects of aesthetic contemplation absorbing our nervous surplusage.

We must now summarize the three generic references of thinking as an instrument similar to those we sought and found in the mechanical instrument.

(1) Thinking is an instrument in reference to some non-cognitive experience, be it aesthetic, economic or social. This does not mean that we think only in order to eat better or that thinking takes place for the sake of action only, or other absurdities. It merely means that the cognitive experience is par excellence a mediating one between some sort of problematic situation and its prospec-

tive fulfillment. That thinking has a sweep and destiny of its own which may subvert the ends to which it is instrumental and install others is not denied. We think in order to do good or in order to do harm, in sheer enjoyment or in utter despair. But we do not think in order to think anymore than we walk in order to walk or sleep in order to sleep.

- (2) Thinking is an instrument in respect to and because of its mode of functional activity. It differs from other organic responses in that signs are its proper stimuli, the drawing of consequences its peculiar reaction. Doubting, guessing, controlled manipulation of things are attendant processes in verification. Its movement breaks up ubon analysis into definite stages but there is no necessary order of succession in specific instances of its exercise. Its organization is more adaptable than is that of the physical machine in that there is a rapid and self-initiated adjustment to unforeseen difficulties. When we spoke of the machine correcting itself there was an implicit reference to the instrumental processes of trial-and-error thinking guiding the machine, for no matter how intricate our secondary contrivances are they do little more than register the fact that the machine is out of order.
- ditioned by certain structural organizations in nature. The ultimate forms of thinking have metaphysical reference. These references are inescapable structural relations and are to thought what the laws of light and the characters of physical media are to the instruments of optics. But the natural conditioning factors are necessary, never sufficient. The kind of lenses an optometrist prescribes depends upon how the patient wants to use his eyes—a use which must be compatible with the nature of light but which is not necessitated by it. Similarly, a train of thinking is guided in the

direction of an outcome which the fact of natural structure must support but whose choice it cannot determine.

From a different standpoint knowledge is recognized as instrumental in the emphasis placed upon the primary presence of desire, impulse and will. Bertrand Russell, once the high priest of disinterested thought, occasionally admits that curiosity is an impulse and 'knowing for its own sake' the activity by which it is gratified.10 Pushing this line of thought a little further, we find that most attitudes or manners of approach to problems are instrumental either to emotional consummations or to practical transformations. The nature of a sensory experience sought for is often foreshadowed or implied in the quality and tonus of the preparatory attitudes adopted in the quest. Especially is this true in the realms of religion and art where ritual and creative practices are often vital factors in generating the peculiar emotional intensity supposed to be their urgent source. Ordinary activities reflect this also. In seeking a new experience the affective qualities of the attitude or pose we adopt are not only instrumental to attaining a certain state of mind; they turn out in addition to be clues and faint intimations of the qualitative tone of the ultimate experience. By playing the lover we may not only come to a bad end and become lovers, like Mrs. Mount in Meredith's Richard Feverel, but we will also learn (no matter how we end) more of what it is to be a lover than if we had not written verse, kept trysts and followed Finck's manual. In emotional situations, more frequently than alas! in ethical situations, we judge of the nature of an end on the basis of the instruments and means engaged in realizing those ends.

A more serious illustration of the type of approach instrumental to practical transformation is furnished by many aspects of historical investigation. If there is genu-

<sup>10</sup>Cf. Why Men Fight, Chap. I.

ine continuity in nature, then the past is significant. nificant in that it helps chart, mine and explore the present and future. Historical analyses, genetic considerations, the imaginative recovery of the past are undertaken and performed because past occurrences are taken as implicative signs of some tendencies and impending event coming to the fore in the near future. We may be mistaken in assuming that the history of a case is relevant in any particular instance, but at any rate the alleged instrumental efficacy of the historical analysis is always the reason for dragging it in. Those who cry out against these remarks as a sinful confusion of origin and nature, history and validity, themselves confuse, if the position outlined here is correct, the operations and experiments which tend to establish validity with the final form which the subject-matter takes as tested and validated. Going the whole hog, we may say that if history is significant for knowledge, and if our knowledge affects our value judgments, there is some likelihood, despite the undistributed middle term, that history and value are not so diametrically opposed as some staunch analytic realists have held. But this will be the theme of another day.

Ideas can be shared and communicated only under the same conditions in which instruments can be communally used, their mechanism explained and their tentative operation guided. Among the more outstanding of these conditioning features are: (1) an appreciation of the critical points and perplexities in the problems and tasks to which ideas or instruments address themselves in hopes of clarifying or adjusting; (2) a perception of where to begin and a knowledge of the *direction* in which ideas or instruments are to be hypothetically applied; and finally, (3) at least a dim prefigurement of the desired end or solution so that there may be sufficient light in which to examine the ultimate adequacy of the various tools—physical and intellect-

ual. We do not ask how instruments can agree with what they are set to work upon for the only intelligible answer must be formulated in terms of results and accomplishments. To insist upon any other answer would be utterly fatuous. Nor are those any more profound who ask how ideas can agree with their objects if they expect any answer except in terms of how ideas operate. Viewed instrumentally, the idea or meaning, in order to show what its character is, must be put into use, at first prospectively, later actually, in some specific matter whether it be a certain region of latent physical continuities or a domain of mathematical operations. An idea cannot literally coincide with an objective fact since it is in no sense a physical thing; but where it is properly chosen its manifold implications parallel the natural ties and conjunctions of subject-matter. At work, it becomes aware that not all modes or methods of attack are equally suitable or efficient any more than wooden wheels or iron sled runners serve equally well for travelling through snowdrifts.

Ideas grow. So do instruments, and for the same reason. The material operated upon is not completely and finally integrated. When the idea balks at this internal, unsuppressable rhythm and dialectic, and attempts to twist and torture its subject-matter into some sort of stability, it goes astray and results in an epistemology or an eschatology. The very instrument with which the epistemologist pens his question and states his problem should furnish the solution to it, one radically different to be sure from what he was led to expect. For the theory of knowledge is the theory of the instrument.

Even though thinking is instrumental, it may be objected, its general processes and formal characters are irrelevant to successful inference in any particular case. It is notoriously evident that logicians whether their bias be inductive or deductive, do not make great scientific dis-

coveries. Insight, inventiveness, genius, are all brought in to account for discovery, and friendly critics set forth the scientist as artist.11 What is the case, however, with the mechanical instrument? Briefly put, instead of waiting for inventions to spring full born from the brow of the mechanic confronted by a problem, the tendency seems to be to make the science of machinery deductive as in the work of Willis, Rankin, Reuleux, and others, so that the fundamental principles of various types of machines might be applied to delimiting and suggesting solutions to particular machine problems. If a problem arises which demands the introduction of a required kind of motion, the science of mechanism suggests or furnishes the means of producing it. In other words, the fundamental features and operative principles of existing mechanisms serve as guiding and controlling ideas for arriving at new mechanical devices and appliances. Naturally, at some point, as in any other train of scientific deduction which proves fruitful in discovery, some experimental fact is assumed generally about the range of continuity, which is not necessarily implied by the premises. This is the familiar risk involved in application. What holds true for technical instrumentation may be carried over to thinking. Of course a man can no more become a scientist or a philosopher merely by making an inventory of his logical concepts than he can become a mechanic merely by learning the names of his tools. But just as the mechanic must know, as a whole, the power and temper of his tools, what they are fitted for and how they can be wielded in supplementary activities, so the scientist and logician must be aware of what types of inference are best adapted to solve problems in different media and subject-matter. The only difference that enters into the comparison is that though the mechanic is conscious of all the physical implements and tools he

<sup>11</sup>Cf. Campbell, Physics, pp. 227-229.

uses, neither he nor the scientist is conscious of the logical methods which express themselves naturally as habits of mind. These methods or leading principles become explicit upon deliberate inquiry into questions of validity. The leading principles of thought, whether they be in science as principles we reason from, or of science, as principles we reason by, fall into certain deductive systems. By following their implications and computing numbers, ratios and measures taken as magnitudes of physical things, we be come as assured of the existence of certain facts in stellar and atomic spaces as we are of the meanings of the data from which those conclusions were derived.

#### H

Viewing thought as something which goes on among things and events, as a process fraught with consequences tragic or comic as they affect desires and purposes, may enable us to cast some light upon the central position of the instrumentalist theory of logic—a position which be cause it is not clearly stated is regarded for the most part as paradoxical and confused. Nothing is more sharply dichotomized in the minds of formal logicians, especially of those who pride themselves upon upholding the scholas tic tradition, than the distinction between the processes in volved in how we think and the terms and forms of what we think. This means among other things that the traits and characters of what is called correct thinking can never be established from the properties and results of actual thinking.

It is claimed here that an examination of how we think furnishes significant indications of the general nature of what we think, and that these types of *actual* thinking which are most effective in helping us to discover "from the consideration of what we already know, something else

which we do not know",12 are the sources from which formal logic derives the compelling qualities of correct thinking. The undeniable fact of human thinking and purposive activity is itself implicative of the further fact that men have already successfully coped with the various problems an ddifficulties in the specific subject-matters in which those embarrassments have arisen. To have emerged with a conception of what our propositions effect and with a confidence in the power of inference to guide us to those effects, implies that the functional dependence of the operations and connections of things must be suggested, indicated or reflected in the forms of inference. Actual thinking goes wrong when it does not get us to where we want to go, or in Peirce's words, when it does not tend towards the settlement and fixation of belief. If we could determine by tossing a coin or drawing a card how future events would turn out, then in the fields in which the predictions are verified, coins and cards would be powerful scientific instruments. If the opiates which Heinrich Hertz used were invariably effective in enabling physicists to reach brilliant and fruitful conclusions, then in setting forth the logic of scientific thought they would have the same claim to consideration as trigonometric tables and other instruments of experimental science. On the other hand, if in matching colors I am guided by a variant of the rule that things equal to the same or equal things are equal to each other. I should soon find myself involved in irresolvable perplexities. We do not think in any old way for, in the main, we are habit bound reacting to new situations with mind-sets that have proved effective in adequately settling other situations. Familiarity with these 'other situations' determines in the minds of other people the limits of con-

<sup>&</sup>lt;sup>12</sup>Cf. Peirce, Chance, Love and Logic, p. 10. The first two essays reprinted in this volume contain the most adequate treatment of the relations between formal and material logic ever written from the standpoint of scientific pragmatism.

ceivability and intelligibility within which the margins of our 'incorrect' or 'wrong' thinking are set. Inasmuch as everyone is acquainted with certain invariants of structure and function in existence, when it is said that we ought to think in a certain manner what is meant, if that ought is not merely to be an impertinence, is that our thought must follow the formal and schematic outline of what we do think or did think when that thinking leads or has led to the satisfactory settlement of a problem. The canons of satisfaction (the reader is begged not to take this word in its personal connotation) are to be derived from certain forms of physical activity in objective situations. There are various ways of 'going about' or 'doing'-good, bad or indifferent. Those forms, to repeat, which actual thinking takes when it leads more frequently than any other, to the completest reorganization of an experience are the principles of thinking we ought to follow in particular cases of the same kind. Ultimately the prescriptive in logic is descriptive of what actually holds true for some segment of existence.

Good or bad thinking, then, as Peirce and Dewey have continually pointed out, is not connected in the first instance with formal thought at all. Just as things of stone and steel become instruments for certain ends, so inferences become tools for certain purposes. The appropriateness of instruments and inferences is determined largely by reference to their terminal completions. The definite ends and purposes towards which thinking is directed are conditioned by the possible rearrangement of subject-matter which already possesses a determinate character and therefore exacts a specific program of action. If in the nature of things different 'thinking-procedures' turn out to be equally good, an examination of their formal features will show that some general formula of 'condition-fulfillment' covers all cases.

Good thinking is fruitful. So is bad thinking-of something else. Of course a wrong key applied to a door together with the exertion of pressure against it may force it open. But if all doors opened that way we should need but one key to get around. Similarly if any kind of thinking were as good as any other, we should never need to take pains with our thinking at all. But we find that some types of thinking are better than others. By examining their characteristics we learn something about the nature of the world in which thinking goes on. Some day, doors may be rebuilt so that they will open to any key; but the pragmatist, admitting that he wishes to alter certain phases of the social background, insists more strenuously than his staunchest critic that far from wishing to remake the whole of existence, he does not even know what such a phrase means.

Yet the instrumentalist position is regarded as antiintellectualistic and irrational at heart. Quite the contrary is the case. What it regards as the paralogisms of reason arise from the attempt in the name of rationalism to impose by a sort of deductive prestidigitation a type of order operative in one region of experience upon another region where it does not apply. The alogical for instrumentalism is not the *ir* rational. Just as soon as its 'unique' order is understood and the terms peculiar to it enter into inference, the generic traits of the alogical are translated into guiding principles and acquire logical potency as they are generalized and find application. Our habits of understanding change as we go from some subject-matters to others; we do not approach problems in human relations as we do problems in mechanics. We may apply the epithet 'illogical' to our thinking, never to existence. Bacon, in whom we find the first glimmerings of an experimental theory of logic, entitled his work Novum Organum. The logical writings of Aristotle were recognized and used as an

organon long before they were called such. To reject the organa of Aristotle and Bacon as inadequate is to indict their metaphysics, that is, their theory and description of existence, not for being thoroughly false and unfounded but for being in certain important respects limited and partial. Only when we follow a purist logic or a purist ethics and delude ourselves into thinking that we can take our standards somewhere else than from this world of matter and motion and mind, can we denounce other views or attitudes, more noticeably of earthly accent and idiom, as irrational or unethical. But if logic declares itself to be the language and grammar of things, then its declensions must reflect the forms of things and its tenses and moods their functions and activities. When how we ought to think is taken as a matter of immediate intuition, then there is or should be no arguing about it. Intuitions in their immediacy are notoriously incompatible with one another from time to time and from person to person. Their ultimate agreement, the only mark of their genuineness, is arrived at as a conclusion of a highly mediated series of inferences and observations. The predicament of the logical intuitionists is almost as anomalous as is that of those philosophers who assert that immediate knowledge is a fact and yet cannot say without falling foul of one another what are the facts which we have immediate knowledge of. If the ought is not a matter of intuition but an indication of relative existential superiority in finding, checking and testing, then logic must be handled experimentally and can never be laid down with an absolute assurance that it holds for all times and places. The belief that absolute assurance is necessary for or equivalent to the validity of inference, it will be remembered, follows only on the hypothesis we are combatting.13

18In an article in the *Century* for December, 1926, Bertrand Russell concludes humorously yet consistently enough with the following:
"Logic was formerly the art of drawing inferences: it has now become

#### TIT

A few remarks on purpose or intention will bring the section to a close. It seems almost axiomatic that if thinking occurs in incomplete situations for the sake of integrating or unifying certain of their dissonant aspects, the movement and truth of thinking in any particular case cannot be completely intelligible without reference to the specific purpose it fulfills or subserves in its subject-matter. Just as we understand things by knowing the ends they serve so we understand a thought when we know its drift and goal. This apparently innocent doctrine has provoked the most vituperative criticism. It has been said that in the interests of logic and decency we should make every effort to understand what a man thinks before we attempt to ferret out why it is he thinks the way he does; that the latter quest is impudent and besides quite nebulous; that even if we succeed in it, our findings are utterly irrelevant to the truth of what it is that a man does believe, etc. Now, what all this criticism proves, when directed against a position such as is outlined here, is that where the instrumentalist writes purpose his 'tough-minded' critics read motive; that where certain facts arising from the attempt of man to predict and control his environment, facts which

the art of abstaining from inferences, since it has appeared that the inferences we feel naturally inclined to make are hardly ever valid.

"I conclude, therefore, that logic ought to be taught in schools with a view to teaching people not to reason. For if they reason, they will almost certainly

Aside from certain logical difficulties which arise from the reflective nature Aside from certain logical difficulties which arise from the reflective nature of Russell's own recommendations, this passage is a reductio ad absurdum of a purely formal conception of logic. On the level of practice, it reduces to a "degenerate" form of pragmatism in that it admits that, whatever efficacy thinking may have, it is in virtue of its own instinctive exercise in a concrete subject-matter rather than by deliberate formulation of its method. Russell evidently recognizes two standards of validity—one which permits him to say that people are to be taught "not to reason" since their natural inferences are invalid, a fact which from our point of view can only be established by the experimental results of thinking, and remedied by teaching them how to control their experiments; and a second standard where he implies that unreflecting practice has its own norms. This latter points the way to an unholy alliance with Bergson! Pragmatically, it makes no difference whether one says that pure logic has nothing to do with existence or vice versa. the traditional logic has assumed and then ignored, have been made explicit by the instrumental school, the analytic friends of the traditional logic have interpreted them in the false light of contemporary psychological fables and will-o'-the-wisps. One is tempted to say: That is what comes of neglecting psychology. But at any rate, purpose is different from motive and pragmatism (or pragmaticism) is not psychoanalysis. In fact, it is the rigor of the pragmatic test which has chased psychoanalysis from the scientific laboratory into the market place.

Purpose for the instrumentalist is as different from motive as novelty is from surprise. Purposes are more objective than any motive can possibly be, for they are set in and can be inferred from the terms and relations of the subject-matter whose rips, tears and open seams thinking tries to sew up. That we are not corrupting an old word by imposing a new meaning upon it can be clearly shown in the distinction made between motive and purpose in ordinary discourse. A government spy may have a motive for joining a radical labor organization. It may be lovalty, rancor or any other prompting equally as difficult to determine. His purpose may be to gain the confidence of the members, acquire a strategic position and urge the acceptance of planks and programs which the government later makes the basis of its prosecution. Those purposes, however, as well as the purposes of the organization in whose activities the government is interested, are as objective as the situation of industrial stress and exploitation which the respective organizations are trying to emphasize or minimize. Surely there is a difference between the purpose a bridge serves in spanning a river and the political and financial motives which may have been behind the project. Judgment of the bridge's adequacy lacks point if it is made independently of those purposes. Knowledge of purposes enables us to test intelligently and so distinguish between by-products and major results.

Purpose as here understood is part of natural function, and structural analysis becomes meaningful as it bears upon and pertains to that function. The fact that a frog is an organism does not render its dissection either unnecessary or uninformative; but the understanding of how a frog behaves—its jumping, breathing, reproducing and dying will never be acquired through chemical reagents and scalpel alone. Likewise the fact that thought or inquiry has a life, an interest or an end of its own, does not render an analysis of its forms or a binding of its movement into a syllogistic strait-jacket either unnecessary or uninformative; but the understanding of the process of inference as a flight from a state of doubt through more or less organized guesses to a state of settled belief, will never be achieved through an ars syllogistica. As was implied in another connection, the syllogism no more represents our mental processes of trial and error than a map we draw represents our actual peregrinations, but where we use either as an instrument to point out or deduce certain conclusions its order entails, it is because it reflects a natural order discovered by other means. If we were permitted to generalize the meaning of the word satisfaction, then, we should say that an idea or system of ideas is logically satisfactory when it includes not only a logical analysis of its part-whole relations but also an appreciation of its tasks and purposes, revealed not by a conjecture at psychological intent but by an examination of objective material. That is what an instrumentalist logic means when it says that knowledge of what the purpose of your thought is-of what it sets itself to accomplish—is essential if not prerequisite to an understanding of what you are thinking. It is the time-honored manner of studying mechanical instrumentation. Indeed, all intelligent presentation of the

history of scientific and social or philosophical thought follows the same track. Every mathematical exercise illustrates it. It is here expressed in such simple and definite form, however, that it is often overlooked. But wherever a mathematician says given, to find, or to prove, he has set the purpose of his thinking and ours so long as we follow him. From the given alone, he could go anywhere, and going anywhere he would hardly know whether he was beginning over again. If thinking does not imply a purpose or goal, discovery would be a blind guess, communication a miracle, and a twice told tale the shattered accents of an echo.

In order to make the point clearer we must tie up our remarks with what was said a few pages back. In a world that has had many histories, what in a Pickwickian sense is called 'correct' thinking may not be good thinking any more than a well-made instrument is necessarily a good one. If we ask for a can-opener we may be given a wellmade carving knife but no matter how nicely constructed the knife is, it is not a good can-opener. When it is said with an air of paradox that a person is reasoning 'correctly' but not 'well', what is meant is that the specific train of thought employed which generally has given true conclusions in the past has failed to lead to a true conclusion in the instance under consideration. The failure is then traced to the selection of premises which are false as a matter of fact. When premises are taken even hypothetically, it is in relation to certain consequences which follow from them significant for the end in view. We discover what a man is driving at by following out the implications of an idea to determine what it points to. Of the idea just as of the instrument it is asked, 'Where does this get us?' The answer lies in the consequences and results to which instruments and ideas alike give rise. The formal consistency of the idea is not all-important and if we do not lose our

breath in a mad rush for conclusions, it is comparatively easy to attain. Many foolish proposals have often been recommended to men's minds because of their thoroughgoing consistency. Formal consistency, however, with apologies for emphasizing the obvious, is never sufficient although always necessary for the establishment of truth. The ultimate power and meaning of the idea is evidenced or presenced in its *denotative* effects. Ideas are rejected for the same reason that instruments are scrapped or replaced, that is, either because they lead to an impasse or because they threaten to produce results we have neither desired nor expected and which, if we wish to solve the problem and not just talk about it, we cannot accept.

We shall close this section by reiterating that purpose is to be read from the characters of the objective situation in which the problem is set for solution, not from the personal motives which tell why someone chose to attempt the solution. An account of the latter might make an interesting story and an enterprising person with an eye to this journalistic age might write the story of the piques and prejudices and sublimated urges which have impelled men to choose one set of problems rather than another. This is as harmless and useful as any other kind of gossip, but it becomes downright mischievous when what is overheard in the philosophic scullery is retailed as the story of philosophy.

## PART THREE: THE ETHICS OF THE INSTRUMENT

The instrument has been used to define an age, a species and a mind. And having proved in addition suggestive for aesthetic analysis, it may also serve to degree an ethical attitude. Observations and reflection show that the possession of instruments or means often determines the ends for which they are used. Finding ourselves with an instrument in hand we experience a motor and kinaesthetic stimulus to bring it to bear in certain immediately suggested ways upon the environment. Called upon to explain our act we reverse the actual order and maintain that the eventual state of the environment was the end we had in mind throughout the entire process—an end which logically necessitated the selection of that particular instrument and movement.

This is the customary analysis of the etnical situation. Starting with a statement of the ends consciously erected or imposed, it finishes with an examination of the means selected to gratify those ends. But this is hardly an adequate description of the facts. George Washington, as the

<sup>14</sup>Cf. Boas, Mind of Primitive Man, p. 96. Man as a "tool-using animal" (the phrase is Franklin's, I believe) has been enshrined in the literary tradition for more than a century. See Carlyle's panegyric in Sartor Resartus, Bk. 1, Chap. 6.

the Cornhill Magazine for September, 1903, among other suggestive things, writes: "That law of adaptation which shapes the wings of a swallow and prescribes the poise and elegance of the branches of trees, is the same that demands symmetry in the corn-rick and convexity in the barrel; . . . and that, exerting itself with matchless precision through the trained senses of haymakers and woodmen gives the final curve to the handles of the scythes and the shafts of their axes. Hence, the beauty of a tool is an unfailing sign that in the proper handling of it, technique is present."

story goes, chopped down the cherry tres because he was given a little hatchet and the play activities of most children have not been different before or since. The ends of their play are functions of the kinds of toys they own. The case is no different for adults in the more serious business of living and working as well as playing. Instead of forging instruments to initiate changes for the sake of an ultimate good which does not itself change, instruments are often wiser or more potent than those who have made them, and shift the ultimate reference farther and farther from the specific terminus which first called them into being. Nothing reveals more clearly its objective teleological relation to a non-personal environment. Besides being on occasions a convenient toy which presented to a refined sense arouses an aesthetic experience, the instrument is more often a dubious and therefore a dangerous possession which gratifies immediate ends only to subvert them.16

The persuasive force of instruments, means and maferials upon apparently independently proclaimed slogans and goals towards whose fulfillment they are later manipulated, makes itself felt in every form of human activity. Who will deny that we frequently decide to build because we have the material and physical instrumentalities at inand? True we are gripped by ideas and intentions which seem to be antecedent to a consideration of ways and means, but unless there is an implied reference to available instrumentalities, these conceptions and purposes turn out to be idle conceits and fancies. The ambitious projects of a madman are waved aside because their execution demands stuff finer than gossamer and an expanse larger than the heavens. A man does not decide upon the songs or parts he wants to sing and then proceed to train his voice

Cohen, in connection with the philosophy, Vol. XI, p. 214. Professor Cohen, in connection with the philosophy of law, has been among the first to question the customary assumption that "the end determines the means and never vice versa." The illustration used in the text is his, I believe.

in order to sing that song or part. So long as sensitive ears rule the world, let us hope that the quality and range of voice a man has, will determine the kind of song he essays. If we are to take literary craftsmen at their word, it appears that not infrequently the intent and direction of their very thoughts take shape from scrap books of inchoate phrases, words and figures of speech, jotted down at various moments as so much literary stuff and ammunition. A half-clothed figure of speech suggests a thought because words, already thickly encrusted with meanings acquired in old and faded contexts, are instruments still vital in social intercourse.

Why so much ado, it may be interposed here, about an influence so inevitable and so widespread? Merely this, that we become genuinely enslaved to instruments when the ends they mechanically and directly set up are unconsciously accepted by us as natural and necessary—when not only the general kind or type of end but its particular character, tone and color are regarded as predetermined. The instrument in use rarely if ever conditions one solitary end. It is suggestive upon reflection of various ends. When that reflection begins there is at least always presented a choice between scrapping it or not. Consciously manipulated and deployed in concrete situations, instruments liberate possibilities by limiting and conditioning others. Where reflection is absent the incidence of the natural suggestive power of the instrument terminates in the nearest, the readiest consummation, in other words, upon something more or less accidental. Becoming insensitive and oblivious of the rich potential of ideals stored in its rib frame of steel, we begin to think of that instrument only in terms of the accidental consummation it subserves. When we decide whether tractors are to be employed for farm purposes or trench warfare, whether aeroplanes are to be converted into bombing machines or into agencies of mail transmission—in short, whenever action follows upon a weighing of the possibilities latent in the material and instrument at hand—we are on our way to an enlightened morality.

All social reform whether undertaken in the name of god, social engineering or revolution presupposes a belief in the instrumental character of social institutions. Reorganization is easiest and most effective when the direction of the change is in line with the natural unfolding and growth of institutional forces. An examination of the instrumentalities of economic production, for example, suggests to collectivists a revision and extension of the social ends of current distribution. These readings in terms of economic forces and resultants distinguish them from the Utopians, who, like the poor, are always with us, and who, in the eyes of those that pride themselves on their social realism, attempt to transform things nearer their heart's desire by the incantation of democratic shibboleths and by philanthropic exhortation rather than by class organization and struggle. Another example from collectivist theory to show how they desire to widen the interest of a political or social instrument may lead to its abolition, is illustrated in the conception of the state. The state regarded as the executive committee of the ruling class, capitalist or proletarian, will in Engel's phrase 'wither away' when economic classes are abolished and will be replaced by more voluntary forms of organization. So long, then, as ethics pays attention to ways and means, instruments and agencies, it is intimately linked with social philosophy.

Although instruments have often been the means of man's enslavement, construed as they appear in their social setting they breathe a promise that they will make him free.

SIDNEY HOOK.

# ALEXANDER'S METAPHYSIC OF SPACE-TIME

### II. SPACE-TIME AND THE CATEGORIES

THAT the theory of the categories is altogether cen-L tral for his metaphysical hypothesis, Alexander has very rightly insisted. Negatively, it is supposed to dispose of the relational theory of Space and Time by showing that relations in general have their basis in Space-Time and presuppose it; positively, it indicates, with remarkable scope and ingenuity, the way in which this ubiquitous entity accounts for and justifies the pervasive characters of the world we know. It seems hardly possible to deny that Alexander has established a very close connection between Space-Time and such categories as substance, cause, and the rest. Yet once more the account is finally and radically inconsistent, and for reasons with which we are now familiar. Never did a thoroughly relational theory have more to recommend it; never was its subordination to a prior absolute more obviously and crushingly disastrous. And for both these reasons the theory merits consideration it has not yet received.

Up to a certain point the whole work can and must be interpreted on a relational basis. The categories are not abstract concepts, complete in themselves, they all "communicate" with the basic category of relation and, what is more important, owe their validity to some specific aspect of the structure of Space-Time, the relation of Space to

Time, of point-instants to each other and the like. Hence the familiar relativity, here insisted upon by our author in no uncertain terms. (a) Just as Space and Time might be considered in abstraction but were really comprehensible only in their concrete basis in Space-Time, so with the categories. An abstract rationalism which treats substance, relation and the rest as if they were sufficient in themselves, and hence moves in a realm of mere possibility, is requested to note that all its balloons are captive ones.2 Like Kant before him, our author insists upon the relativity of the possible to the actual, and each category must finally justify itself by its place and function in the empirical world. Even Bradley's criterion of self-contradiction must abate its absolute pretensions: "Deriving its validity from Space-Time itself, it cannot be employed to undermine the reality of Space and Time and reduce them to appearances of an ultimate reality which is neither, but accounts for both. If Space-Time is the ground on which the criterion of contradiction is based, Space and Time are not themselves contradictory." Surely the relativity of form to empirical reality was never more urgently presented.

(b) The opposite mistake of extreme empiricism is equally avoided. As there are no absolute concepts, so equally there is no absolute datum to which the categories must be added externally. Things are related, and intrinsically related, from the start because they are intrinsically spatio-temporal. Neither a transcendental unity of apperception nor a tendency to feign is necessary to introduce categorical relations into a world that knows them not. The structure of things does really belong to them de jure, and the whole purpose of the theory is to demonstrate that

<sup>&</sup>lt;sup>1</sup>S. T. D., I, p. 324. We are warned here not to speak of a relation between Space and Time but the term "connection" which Alexander uses is, for our purposes, identical. Wherein a connection differs from a relation, our author does not explain.

<sup>2</sup>S. T. D., I, p. 177.

\*S. T. D., I, p. 206.

fact. And here, oddly enough, Alexander is following the spirit and teaching of Kant, divorced from the vicious subjectivism of that doctrine.4 The essence of the Kantian reply to Hume and the empirical vindication of causality lay in connecting it with the character of Time, that of substance in its implication in Space and Motion. As surely as Space and Time are facts of experience, so surely are the categories of the "dynamic" group applicable to all possible experience. For Space and Time would not be what they are unless they were connected in just these ways. Once freed from the unhappy presuppositions of the transcendental Aesthetic, which it so plainly contradicts, this doctrine is an abiding contribution to a relativist theory of the categories, as Brunschvicg has recently shown,5 and Alexander, in extending it to the categories in general and interpreting it objectively, stands assuredly in a great tradition.

Finally (c) this theory meets the ultimate objection levelled against the relational view of the world. The categories, and particularly relation, are valid because they are features of a world itself relational through and through. In his reply to Bradley, Alexander urges that the criticism of relation gains its plausibility from the fact that relations are treated as if they did not relate. So Space and Time are supposed to be contradictory because their connections to each other are ignored. Once it is realized that Space-Time is genuine continuity, that Space connects Time and Time Space, the objection is met. If relations had to fall within a super-relational unity, then indeed they could be but appearance, but if the reality is itself "togetherness and distinctness", such relations will find their place in it not as an alien element, but as being of the nature of reality itself. And hence the relativity of finite

<sup>&</sup>lt;sup>4</sup>S. T. D., I, p. 190.

<sup>&</sup>lt;sup>5</sup>L' Expérience Humaine et la Causalité Physique, Part V, Book XVIII.

beings does not compromise their reality. "All finites being complexes of Space-Time are incomplete.-But their absorption into the One does not destroy their relative reality. That could happen only if the real into which they are absorbed were of a different stuff from themselves. But to be a complex of Space-Time is to be of the stuff of which the universe is made. Now a configuration of motion is not destroyed by its relation to the circumambient medium but is, on the contrary, sustained thereby."6

The specific derivation of the categories follows directly from what has been said above. (a) The "non-empirical" nature of the categories is in no way due to their independence of the experienced world in general. They do in fact enable us to "anticipate" particular experiences, but only because they are pervasive and apply to any experience, and hence to all particular ones. And this pervasiveness, their one distinguishing feature, is due to no virtue of their own but to the fact that they are the features of Space-Time as such. And since, on this hypothesis, any empirical thing is at least spatio-temporal, it follows that it will possess such characters as are proper to Space-Time. Thus essentially, "the categorical characters of things are features of any bit of Space-Time as such, merely so far as it is spatio-temporal".7 (b) Though thus limited as to independence, the categories are absolute in their scope. Mind and its objects are categorically connected within a common world, and we need look for no especially favored region of experience to which the categories are peculiarly applicable and beyond which they must be extended by analogy. The common structure of the world, the warp or structure for the rich embroidery of qualitative being,8 is vindicated against the sceptic. No doubt it is relative to the empirical world, but that world is no less relative to

<sup>&</sup>lt;sup>6</sup>S. T. D., I, p. 346. <sup>7</sup>S. T. D., I, p. 189. <sup>8</sup>S T. D., I, p. 186.

it, and in this reciprocal connection the problem of the categories finds its solution. (c) It is possible to see in what precise sense a "deduction of the categories" can be secured. In one sense there can be no such deduction, as Alexander insists. The features of Space-Time are what they are and we can only point to them.9 Thought must accept the world and not ask why it should be this world rather than some other. But in another sense Alexander insists upon such a deduction in the most rigorous fashion. We can tell why empirical things should have just these and these characters in virtue of their spatio-temporal basis. Thus Kant is taken to task because "he is unable to give a satisfactory account of the reason for intensive quantity"10 and our author out-deduced his predecessor by indicating the precise spatio-temporal connection which accounts for this category. And so for each of the others, a specific basis in Space-Time is discovered, continuity, uniformity, or the like, from which the category as a feature of any empirical situation follows directly. And apparently this derivation is necessary for all genuine categories, for likeness is denied that title precisely because "there is nothing in Space-Time which requires (though Space-Time admits) the overlapping of empirical universals." Hence we have something very like a "metaphysical deduction" on a very substantial basis.

But once more, this is only half the story, and the other half is the complete and final negation of all that has gone before. Alexander really does mean all this, but he must needs combine it with those absolutist presuppositions which proved so destructive for Space-Time. And with such a foundation, we can hardly hope for better fortune here. So we find that each of the principles so far considered is sacrificed in its turn. (a) The categories were

 <sup>&</sup>lt;sup>9</sup>S. T. D., I, p. 337.
 <sup>10</sup>S. T. D., I, p. 310.
 <sup>11</sup>S. T. D., I, p. 249, my italics.

to be relative to the empirical reality, thus putting a formalistic rationalism in its place. But this empirical reality is pure Space-Time, the most barren of abstractions, an absolute in itself. To this all the categories must perforce be reduced. They are empirical not in the legitimate sense of conditioning and being conditioned by the world of events but in the mythical sense of actually being composed of spatio-temporal stuff. Once more the absolutist cannot stop with an ultimate relativity, he must proceed to identification. The categories not only are relative to Space-Time but they are Space-Time. Again the ruinous fusion of form and matter. The categories, no more than Space and Time, can fulfill their relational function when they are substantialized in this fashion. Hence in each case a conflict between the relational function of the category and the particular existence which its reduction to Space-Time confers upon it.

- (b) Contrary to the initial assertion there *is* an aspect of the world which is above the categories and from which they are imposed upon the rest. There is an absolute which is not conditioned by the relational structure of things. And that is pure Space-Time as a whole. It is the source of the categories but is not subject to them. They are conditioned by it, but the dependence is not reciprocal. Mind is on a level with empirical things but this new absolute cannot "descend into the field of Number", nor of the other categories, as our author specifically asserts. Substance and causality need Space-Time, but it does not need them. They do not condition its very being but are simply characters or features derivative from it.
- (c) The justification of relations is thus withdrawn. For Space-Time in this sense is as much a "super-relational" whole body as Bradley's own Absolute. The intricate structure of perspectives which was to guarantee its to-

<sup>&</sup>lt;sup>12</sup>S. T. D., I, p. 339.

getherness and distinctness cannot now be ultimate, for that was a relational structure, assuming from the start those very connections which are now said to be inapplicable to the "One" Space-Time. And if that structure is not ultimate, neither are the categories. The "One" does in all truth engulf the many and the outcome is the precise opposite of the initial position. But each of these assertions must be justified in detail.

First, consider the substantialization of the categories. This follows logically enough from the initial assertion that all relations are of the same stuff as the terms they relate. But Alexander is quite specific. For motion in the singular, "a motion, or a space or a time" is a category and such motion, it will be remembered, is the basic stuff of reality. "It might be objected that a motion or a bit of Space-Time is a real existent concrete thing and therefore cannot be a category. Such an objection would imply a complete misunderstanding of the nature of the categories. They do not express mere adjectives of things, but concrete determinations of any space-time. Existence is the occupation of any space-time. Universality, for all its abstract name is a concrete plan of arrangement of spacetime, relations are connections which are themselves spacetimes. There is therefore no difficulty from this point of view in treating motion or a motion as categorical."11 And elsewhere we learn quite emphatically that "all the categories are configurations of space-time. The only difference is in pervasiveness of the categorical as distinct from the empirical determinations."14

Now a chair is an empirical determination or configuration of the same space-time and apparently only falls short of being a category because there is not enough of it. If

but the difference is that of "configuration" and stuff configured, and the configurations are as concrete as the unformed stuff, though not as ultimate.

14S. T. D., I, p. 321.

a motion is categorical there is nothing that is not. It is only the particular kind of motion which is empirical, but that is an additional determination. Just as the Pythagoreans attempted to make a world of numbers, identifying the form and stuff of things through the medium of spatial arrangement, so does Alexander carry on that hardy tradition. The paradoxes of Zeno served to indicate to these early rationalists that positions and concrete motion must be distinguished, that form and matter are disparate and things are only like numbers. Equally paradoxical consequences may yet prove that Space-Time is not the stuff of chairs and categories.

Three categories are of central importance here. Take universality. There are two aspects of the problem. What is universality, and what are universals? We consider the latter first. A universal is a plan or pattern or habit. "Particulars are complexes of space-time and belong therefore to the same order or are of the same stuff as the universals which are plans of space-time." What kind of being has the universal "dog" for example? The answer appears to be unequivocal. "Being—is the same as determinate being or existence." And again: "There is no category of being, then, other than determinant being or the existent. Since existence is occupancy of a space-time in exclusion of other occupancy, and since such occupation is always temporal, existence must not be limited to present existence but includes past and future."16 Now we should suppose that a plan or pattern is not at all the sort of thing that could occupy one space-time in exclusion of other company, for many particulars partake of the same universal. Yet if universals are made of space-time stuff they are obviously as particular as their instances and exist in the same exclusive sense. A universal can no more be in two places

<sup>&</sup>lt;sup>15</sup>S. T. D., I, pp. 220-21.

<sup>&</sup>lt;sup>16</sup>S. T. D., I, p. 200.

at once than a particular dog. And in that case it has

lost all vestige of universality.

Obviously our author cannot accept this result. Having reduced the universal to existence we are later to find that "they are never bare potentialities—but posses such actuality as they can possess, which is not particular actuality or existence."17 And having heard that all reality was the occupancy of a space-time in exclusion of other occupancy, we now learn that "the universal-may be said to possess that kind of existence which is called subsistence. For it is free from limitation to one particular space and time. The universal is nowhere and nowhen in particular but anywhere and anywhen, and in Hume's language is in readiness to start into being (which is existence) when the occasion calls. It is not timeless or eternal as being out of time, but as being free from limitation to a particular time."18 If this last statement is true, then the attempt to reduce universality to space-time occupation or "determinate being" has failed. Unless it is true a universal cannot be what this theory demands, a plan or law of construction common to many instances. And unless it is both true and false at once the fusion of form and matter has failed. The contradiction is quite obvious, and so is its basis. As Time could not be a series of positions and also that which occupies positions so a universal is not both a particular existent and a unifying principle for distinct existences. The "third man" difficulty is with us again, and Alexander tries to meet it.

The reply takes us from the universal as an entity in itself to universality, or the category in virtue of which there are universals. And this is unquestionably a great advance. "There is no question of any plan mediating between the particular and the uniformity of Space-Time;

<sup>&</sup>lt;sup>17</sup>S T. D., I, p 226. <sup>18</sup>S. T. D., I, p. 222.

the plan is an embodiment of that uniformity. The universality of the plan is the capacity of Space-Time to respond on each occasion according to this plan."19 further: "The habit of Space-Time to which it (the universal angle) is equivalent is the possibility of the existence of such a configuration at any point."20 A universal then is no thing, but rather a capacity, a possibilty. And Space-Time itself is the basis of this possibility. It is the constant curvature of Space-Time, the fact that this entity is uniform in its relation to bodies so that a body does not suffer distortion when it changes its place, which is the possibility of identity in kind between particulars and hence is universality. There are particulars, and there is uniform Space-Time in which they may be identical in one or more ways in spite of their differences in place and date and hence, in spite of their particularity. And this is the fact of universality.

Hence the problem seems solved and we are tempted to set aside the initial contradictions as incidental. All beings are particular, and they are distinct in virtue of their spatio-temporal differences. But if Space-Time is uniform then, as elementary geometry teaches, difference in place and date is quite compatible with identity in character. Such universality is properly termed a possibilty or capacity because it is precisely such possibility that Space-Time guarantees. So far as Space-Time is concerned, the same plan may be repeated anywhere, for a uniform structure does not specify the particular nature of what is here as distinct from what is there. Hence that possibility of repetition which is the sign of the universal. Thus, meeting the objection that this conclusion contradicts Einstein's general theory, Alexander says: "When I say that bodies do not change their configuration by displace-ment in Space-Time,

<sup>&</sup>lt;sup>19</sup>S. T. D., I, pp. 219-20.

<sup>20</sup> S. T. D., I, p. 219, my italics.

I mean this only so far as Space-Time itself is concerned." In the presence of a gravitational field, with which matter is here identified, warping occurs, but not in "Space-Time" itself. Hence the initial indetermination which is the capacity of repetition.

Now it is obvious that all this depends upon the distinction between Space-Time and matter being sharply drawn. No particular event can be a possibility in this sense, and if Space-Time is not to be distinguished from the particular bodies then it loses this indetermination and uniformity. On precisely this basis Whitehead has argued against the general theory of relativity for failing to make such a distinction.22 If Space-Time is to be merged with matter and physics reduced to geometry then uniformity is lost and Space-Time is as particular as bits or matter, which, according to Eddington, it constitutes. Hence the alternative rendering in which a sharp distinction is still made between form and matter, Space-Time falling on the former side as a "locus of relational possibility". It possesses "constant curvature" because it does not constitute events in their specific particularity but only relates them in a uniform structure.

Whether this criticism holds ultimately against Einstein may be doubted, for that theory does seem to guarantee some measure of uniformity, at least in space-time interval. But it does hold obviously against Alexander himself. Surely he is of all men the least entitled to distinguish between "Space-Time itself" and that which occupies it, or which it relates. For the determinate being of particular things as particular is constituted by the Space-Time which they are. Each event, so far as it is different from any other, is thereby a warp in Space-Time; the difference is not something extrinsic to Space-Time

<sup>&</sup>lt;sup>21</sup>S. T .D., I, p. vii, my italics.

<sup>&</sup>lt;sup>22</sup>S. T. D., I, p. viii emphasizes Alexander's view. For Whitehead's statement see especially *The Principle of Relativity*, Chapters 2-4.

itself and to which it is indifferent, the difference is Space-Time and so far as particular things exist at all Space-Time is not uniform. More recently Alexander has referred with approval to Eddington's suggestion that matter is a warp in Space-Time and not a distinct and additional entity, has treated it as in harmony with its own hypothesis.23 What this leaves of the distinction between "Space-Time itself" and particular things, the distinction which Alexander himself was constrained to draw to find a basis for universality, it is difficult to see.

The situation is the familiar one. So long as you distinguish form and stuff you may have diversity in one respect, identity in another, but when they are identified your Space-Time is held to be diverse in precisely the sense in which it is uniform. The appeal to "possibility" will not help, for there is no vestige of possibility in actual occurrences and to such the world is limited. Nor will relations or laws help to make the distinction, for in pure Space-Time the relation is of the same stuff as its terms and the plan is not distinct from its execution. That Alexander should thus be forced to break completely with his own absolutism only by accepting the principle of "warping" he previously recognized as destructive is indeed instructive.

With universality we found Space-Time too substantial to account for universals, or even for the possibility of universals. With substance the opposite difficulty arises. The definition of the category is admirable. By substance we mean "the persistence of a piece of space in time"24 or "the persistence of this including space through a lapse of time."25 What substances does Space-Time offer us? There can be no doubt. Pure events or point-instants are the elements of Space-Time, hence the category of sub-

<sup>&</sup>lt;sup>23</sup>Spinoza and Time, p. 40. <sup>24</sup>S. T. D., I, p. 271. <sup>25</sup>S. T. D., I, p. 270.

stance applies primarily to them. "The simplest substance is consequently a movement. When we take this substance in its limiting form we have the point-instant which may thus be called a momentary substance. For a point-instant is by its very nature a movement, not something statical. It is an ideal, not an actual movement; and just for this reason it is the actual elementary existent, and is real just in virtue of its ideal character."26 There is no escape from this conclusion if motion is reducible to positions, to point-instants. But the contradiction is obvious. A substance was to be a contour of space persisting through a duration, but the element of Space-Time is an extensionless point occurring at a durationless instant. A point is not a piece of space and an instant is not a duration of time hence plainly the category as defined is not applicable to them. It requires concrete events with some unity of their own, not the bare diversity of positions. But our absolute and primordial reality has none to offer. Too much of a stuff to account for form, it is yet far too formal to account for substance.

In the case of causality the very definition indicates the difficulty. "This relation of continuity between two different motions is causality." Only if motions are different is the one said to cause the other. "The mere continuance of the same uniform motion is as we have seen not a causal connection. The only identity between cause and effect is to be found in their continuity." Yet equally, as the above quotation asserts, they must be continuous, for such continuity is causality. Now if motion were distinct from Space-Time this would be quite legitimate. The motions must be distinct as motions, but they might still be continuously connected by their dates and places. Johnson has recently shown how much discontinuity of this sort is

<sup>&</sup>lt;sup>26</sup>S. T. D., p. 272. <sup>27</sup>S. T. D., I, p. 279. <sup>28</sup>S. T. D., I, p. 285.

compatible with continuity in Space and Time.29 But that depends precisely on distinguishing concrete extensions and durations from points and instants. Here there is no such distinction and Space-Time is Motion. Hence if motions are discontinuous as motions, as they must be on this hypothesis, they are not spatio-temporally continuous, while if they are continuous as the definition demands, they do not possess the requisite diversity. Once more they must be identical in precisely the sense in which they are said to differ.

Other categories and especially intensive quantity illustrate the same difficulty, but we must turn directly to relation itself, for the heart of the difficulty lies here. The devastating assumption throughout is that relations can only be real if they are of the same stuff as their terms. To be equally real they must be the same kind of reality, even the same reality. Green and the idealists are controverted once we realize that "If the bits of Space are points they are connected by the points which intervene. Relations in space are possible because Space itself is a connected whole, and there are no parts of it which are disconnected from the rest. Whether we call Space and Time a system of points and instants or of relations is therefore indifferent."30 And "on our hypothesis it is clear that in the end all relation is reducible to spatio-temporal terms."31 The result is inevitable. Once the relation is reduced to stuff it ceases to be a relation and no longer relates. So we saw for each of the categories. If universality is substantialized vou need a third thing to relate the particularized universal to its instances, if structural continuity is identified with the diversity of movements, it fails to connect them, if the relation "between" point-instants is only another point-instant, it fails to connect them. If the terms

 <sup>&</sup>lt;sup>29</sup>Logic, Part III, Chapter XI.
 <sup>30</sup>S. T. D., I, pp. 166-7.
 <sup>31</sup>S. T. D., I, p. 239.

are to be identical in kind they must have something in common, but it certainly cannot be the space-time of either for they are diverse and exclude each other. Neither can it be a relation for that is a third space-time "outside" of them both. But repetition is no longer necessary.

The result of this situation brings us to the denial of relativity in our second sense. Since relations are made of Space-Time they depend upon it in a new sense. Any relation is incomplete in itself and in that sense depends upon the term it relates; it must always be a relation of. But now it depends materially upon Space-Time as the stuff of which it is made. Thus when Broad attempts to resurrect the relational view of Space and Time the reply is not that such relations depend upon concrete terms, which to true enough and illustrates the relativity of form and matter, but that they are themselves such terms and depend upon the stuff of which they are made. "If I am right, then these so-called neutral concepts, relation, number and the rest, are themselves made of Space-Time and presuppose it, and they are not neutral but concrete like Space-Time."32 Hence the dependence is not reciprocal. A table could not be what it is apart from the wood of which it is made, but the wood itself could perfectly well have existed without being fashioned in this particular way. So a relation is a particular configuration of Space-Time and does not determine Space-Time in itself. And so of the other categories. "Just as a roll of cloth is the stuff of which coats are made but not itself a coat, so Space-Time is the stuff of which all things, whether as substances or under any category, are made."38 Hence the inevitable conclusion, from which our author does not shrink. "There is a well-worn proposition familiar to idealists, and derived from Kant, that the source of the categories is not itself

<sup>&</sup>lt;sup>32</sup>Mind, N. S., Vol. 30, p. 411, my italics.

<sup>&</sup>lt;sup>88</sup>S. T. D., I, p. 341.

subject to the categories. This proposition is true. They apply in our conception of the matter to the empirical things which are special configurations in Space-Time and because they are such; but they do not apply to Space-Time That which is related is relative, but the whole Space-Time is related to nothing, hence unconditioned.

We are back with the early Greeks, and the properties of the world are to be explained by the material of which it is made. The justification of the categories is then on a par with the assertion that if all the world were rubber every bit of it would stretch. So the categories are the properties of Space-Time, following from it but not conditioning it. And though Alexander denies that they are mere adjectives of this absolute he adds in the same sentence that they are "features" of it, "in the sense in which red is a feature of this rose". 35 The relational structure on which the specific categories were to be based cannot be a real basis, for this structure is itself a mere "feature" which does not condition the reality in its absoluteness. All are derivative and above them all stands the "One". True we have described it in just such relational terms but that is apparently secondary. "Our description of Space-Time itself and of the features which belong to any bit of it is but a means of reaching by thought to what is deeper and more fundamental than the products of thought."36 Why the entities described should be here set down as "products of thought" by Alexander of all men is by no means clear, but that the whole relational structure with which we have been working is now quite secondary seems plain. Bradley could hardly ask for more.

The contradiction between the relative and absolute views has here reached its climax. On the one side there is the view with which the work began. There neither

<sup>34</sup>S. T. D., I, p. 337.
35S. T. D., I, p. 197.
36S T. D., I, p. 337.

Space nor Time was complete in itself and the required combination demanded a highly articulated system of perspectives, conditioned through and through by relations. Only in this form and as thus related could Space-Time be real at all. And if that were true then quite emphatically Space-Time is subject to the categories. The nature of a line of advance is quite incomprehensible apart from causality, and relation above all is fundamental. Unless these various relations which are the categories held for Space-Time, there would be no Space-Time. True enough the dependence is reciprocal, but that is the last thing in the world from the one-sided dependence here asserted.

On this view Space-Time is neither "source" nor "whole". It is not the independent stuff which may not be formed into a coat, only as formed in this particular fashion does it exist. Nor is it a "whole" in any absolute sense. A whole of perspectives would be conditioned by its parts and specifically conditioned. It would be less absolute than its various determinations, not more so, for it is the synthesis of them.37 To say there is nothing external to it is to forget its temporal character, its radical incompleteness, which presupposed relation to a future which is still to be. Of course a relational structure is not relative in the same sense as concrete things, as Alexander's examples are meant to show, but it is no less relative. If it is stuff it is relative to its determinations and exists as thus determined, if it is structure it is relative to the events it relates. Only by robbing each element of its essential character has this absolute been attained.

There is no doubt that the second and absolute view of Space-Time has now triumphed. The indentification of opposites is positively breath-taking. "Infinite Space and infinite Time are one and the same thing, and cannot in

of "total" Space and Time, in our analysis of the theory of knowledge.

reality be considered apart from one another."38 was just because they were distinct as such and radically distinct, that each could save the other. "The infinite Space-Time is the totality of all substances, but it is prior to the substances by whose composition it is described."39 Yet it was the differentiation of point-instants, specifically designated as substances, which conditioned the very being of Space-Time. Nor is the future external for, "in the redistribution of dates among places, new existents are generated within the one Space-Time"40 so that all change is within the absolute, precisely as Bosanguet would desire. And so on. The relative view is now completely superseded, determinations are within but not of absolute.

Finally we must notice the type of revenge which a relational world will take on this type of absolutism. It will be remembered that relation, Space and Time were defended by our author against the Bradleyan dialectic on the ground that a world of togetherness and distinctness accounted for all without contradiction. If relatedness is itself ultimate, there can be no paradox about relations. But when that ultimacy is surrendered disaster is to be anticipated. "And now mark the revenge which the universe takes upon those who do not accept it on its own conditions."41 (a) The continuity of Space and Time was impugned by Bradley and the answer was that this criticism applied only to "abstract" Space and Time, not to their concrete connection. And the idealist was said to have fallen into this error because he treated relations as if they did not relate. But we have seen Alexander fall into the same pit. There is no more "continuity" in a point-instant than in its elements, the abstraction is as great as ever. Nor can the connection be between them,

<sup>&</sup>lt;sup>38</sup>S. T. D., I, p. 340. <sup>39</sup>S. T. D., I, p. 341. <sup>40</sup>S. T. D., I, p. 339. <sup>41</sup>S. T. D., I, p. 260.

for the relation is of the same stuff as the terms. And it is so treated precisely because it does not of itself relate. The difficulty remains, and for the same reason precisely.

(b) Bradley discovered a possible plurality of time series with no genuine connection in Time. Once more Alexander rises to the defence. "Since Time is spatial, the unity of these time-series in Time is secured by their unification in Space, by their belonging to the one Space. Occurring in the one Space, these time-series are connected in Time by the temporal relations between their respective places. Correspondingly the unity of all Spaces is secured by their belonging to one and the same timeseries."42 The circularity of all this is inescapable. We were first told that purely temporal unity was inadequate and some further connection required to save it. Hence "independent" lines of advance were specifically recognised. But the unity of these series must be that of a container in which they occur. Hence the "one" Space. But why "one" Space when Space is supposed to be differentiated by Time and hence partake of its differences? Because all spaces belong to "one and the same time series". But then there are not many time series and the initial defect remains. Or if there are, then not one Space, since a single time series was to unify it. The procedure is selfdestructive throughout.

This final difficulty is not introduced to resurrect old scandals but because its basis is now so obvious. Relations are not a sufficient form of unity, they must be "in" one Space and one Time and only so can diverse elements be related. Betweenness must be subordinated to an embracing medium because "relations of space and time are intrinsically for metaphysics relations within Space and Time, that is within extension and duration." Only such

<sup>&</sup>lt;sup>42</sup>S. T. D., II, pp. 234-35.

<sup>&</sup>lt;sup>48</sup>S. T. D., I, p. 174.

a medium, itself above relations, can account for the relations within it. Hence the unity of many time series can only be a container which flatly contradicts their diversity. All of Bradley's difficulties apply with redoubled force, and for the same reason. In a super-relational unity the diversity and relativity of spatial and temporal positions is indeed incongruous, and the result of Alexander's hypothesis is the best proof of that fact. A relational unity of perspectives is precisely what Space-Time ought to be, the relation is the connection and there the matter ends. But if relation itself must be in and made of a prior absolute we are forced back to the very blank unity of one undifferentiated Space which was initially rejected for the best of reasons.

It will be remembered that the final advantage of this theory was its treatment of the "one" and the "many". Differences were not to be superseded because "The One is the system of the Many in which they are conserved, not the vortex in which they are engulfed." It can now 44S. T. D., I, p, 347.

be seen that it is exactly the reverse. Only in blank extension are terms and relations of the same stuff and we learned at the outset that in such extension there is no differentiation of parts. That came with perspectives, and there no such homogeneity remains; the relation between two perspectives in different series is not a space or time in either. Nor can they be in a further space-time, for this would either be differentiated in the same way and hence in need of further unity or it would be undifferentiated and then "open to fatal objections" as Alexander told us at the outset. Unless the differentiations are determinations of it, then it is no reality; if they do distinguish it in the required fashion it is a sum of perspectives on different lines of temporal advance and lacks the only sort of unity our author can provide for it. The vindication of Bradley is

complete. The relations fall outside the unity and our intellect cannot tell us how they can belong together. And the reason is that the unity we envisage is super-relational, a unity which excludes the very distinctions upon which a world of "togetherness and distinctness" would depend. If the many are really different their relations cannot be "homogeneous" with the terms, for the terms are not homogeneous with each other. If the many are really connected, then we were mistaken in regarding them as really different for, in the end, all are reducible to a single stuff and the differences within this single stuff are again not real differences, else they could not be connected by homogeneous relations.

The theory of knowledge carries on this conflict and provides a final witness for the destructive nature of the absolutism here in question.

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